Southwest Region University Transportation Center

PRIOR: A Computer System for the Simulation of Port Operations Considering Priorities

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16. Abstract

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Two separate reports are dedicated to the simulation system. This report is intended to provide a glimpse into the general characteristics of PRIOR. A second report, entitled "The Calibration of PRIOR, a Computer System for the Simulation of Port Operations Considering Priorities" focuses on describing the calibration process followed by the research team to ensure an adequate representation of the test case. Other reports focus on the role of information technology, optimal yard allocation and performance analysis of the different systems.

Rather than being an exhaustive user guide the objective of this report is to describe conceptually the main characteristics of the implementation. The first chapter provides a brief description of the simulation system, mostly conceptual. The second chapter includes an example. As a part of this example, all the input and output files are presented.

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PRIOR: A COMPUTER SYSTEM FOR THE SIMULATION OF PORT OPERATIONS CONSIDERING PRIORITIES

by

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Research Report SWUTC/96/721928-2

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EXECUTIVE SUMMARY

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Rather than being an exhaustive user guide the objective of this report is to describe conceptually the main characteristics of the implementation. The first chapter provides a brief description of the simulation system, mostly conceptual. As part of this description, the operational principles of the implementation, the computational structure and input and output files are briefly described. The second chapter includes an example. As a part of this example, all the input and output files are presented.

The runs presented in chapter 2 were performed on the mainframes of The University of Texas at Austin. The size of the program prevented its use on personal computers.

ABSTRACT

As part of the research conducted at The University of Texas at Austin on the implementation of priority systems at container ports, a simulation system was developed. This simulation system, PRIOR, has the unique capability of performing micro-simulation of port operations considering different operational schemes depending on the container's priority.

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INTRODUCTION

As part of the research conducted at The University of Texas at Austin on the implementation of priority systems at container ports, a simulation system was developed. This simulation system, PRIOR, has the unique capability of performing micro-simulation of port operations considering different operational schemes depending on the container's priority.

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CHAPTER 1. DESCRIPTION OF THE SIMULATION SYSTEM

This section begins with a general description of the simulation system that focuses on the logic of the implementation providing the framework in which the different operational policies are described.

1.1 OPERATIONAL PRINCIPLES OF THE IMPLEMENTATION

In this section, a brief description of the simulation system is provided. This description is intended to provide the reader with a general idea about the simulation system and its capabilities and limitations.

The computation system is comprised of two programs, PRIOR and ECON. The former performs the simulation and the latter post-processes the simulation output to produce economic indicators of performance.

1.1.1 PRIOR

The simulation system, PRIOR, performs a micro simulation of terminal operations. In this simulation, the terminal is modelled using arrays to represent the storage location on ship and in the storage yard and the network of links representing travel times for the different servers. Figure 1.1 shows a three dimensional representation of the system.

The truck network is represented using a directed network. The yard crane and gantry crane network are represented using non-directed networks. The program has the capability of simulating stochastic travel times, though this option was not used in the simulations. Figure 1.3 shows a representation of these networks, as well as the yard lots considered.

Figure 1.1: 3-D representation of the system

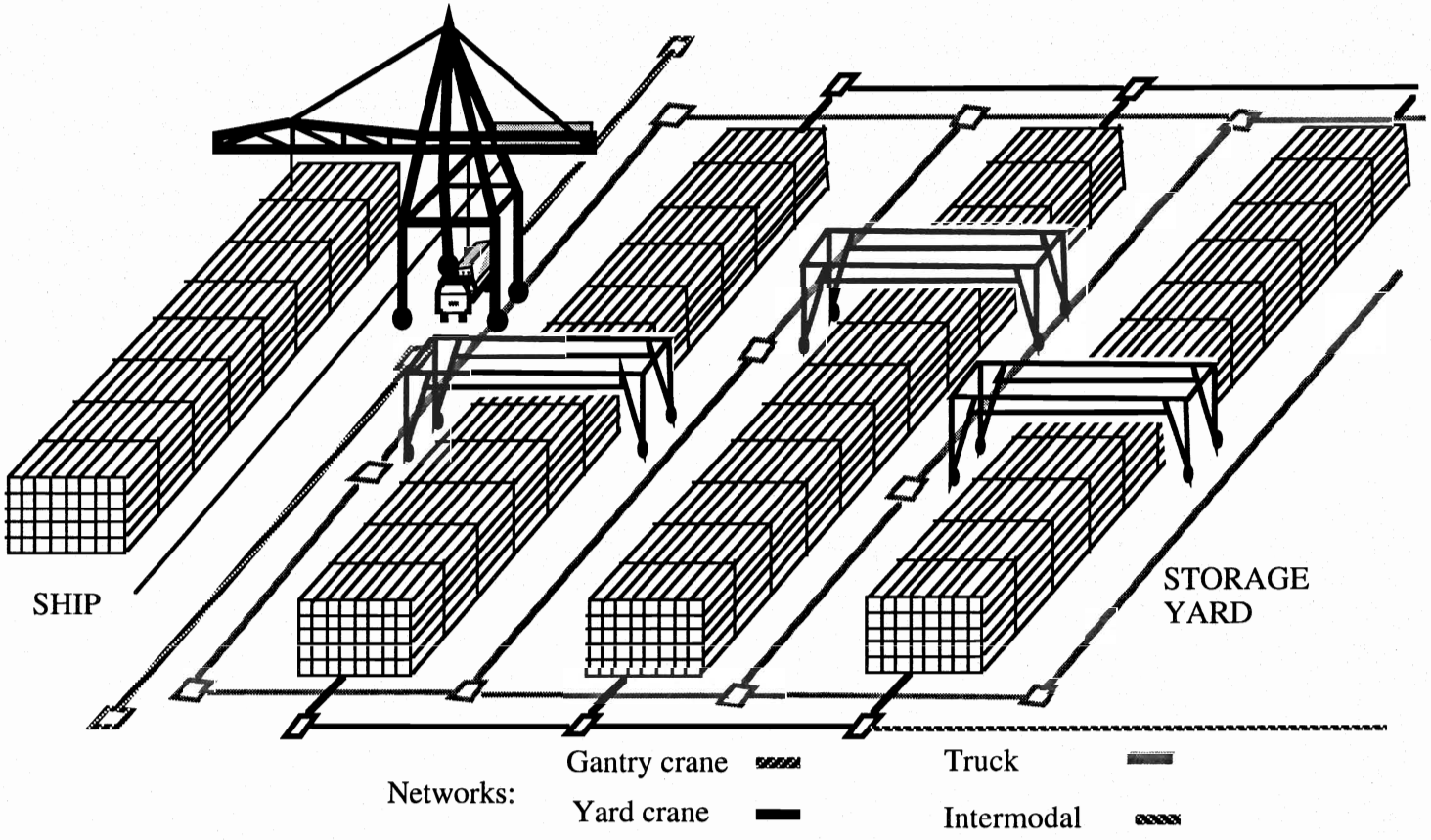
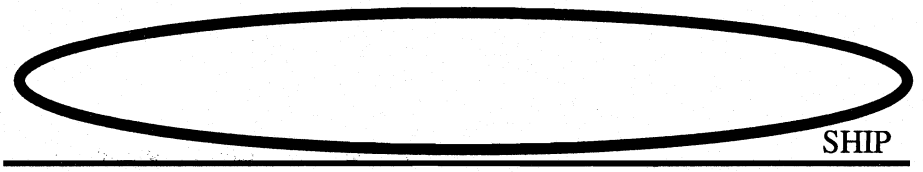
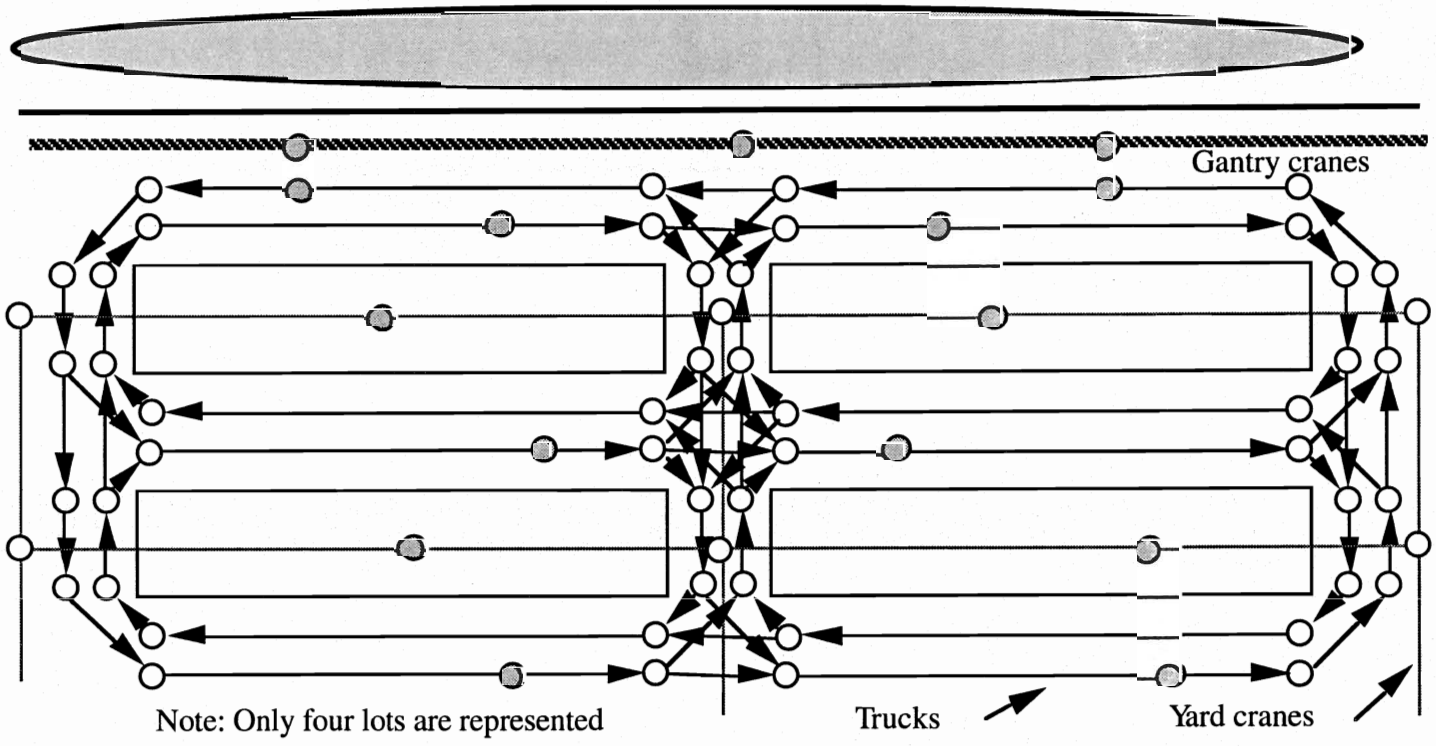


Figure 1.2: Yard lots



Lot #1	Lot #13
Lot #2	Lot #14
Lot #3	Lot #15
Lot #4	Lot #16
Lot #5	Lot #17
Lot #6	Lot #18
Lot #7	Lot #19
Lot #8	Lot #20
Lot #9	Lot #21
Lot #10	Lot #22
Lot #10	Lot #23
Lot #12	Lot #24

Figure 1.3: Plan view of the networks



The simulation system, PRIOR, is based on the following operating principles:

String of ships:

The file SHIPS.DAT contains the string of ships expected to call at the port. This file contains ship description, arrival time and the fractions of high and low-priority containers. The current version of the simulation system assumes that all ships carry the same number of containers, though the fractions of each container type might be different.

At the beginning of the simulation run, the SHIPS.DAT file is read and the corresponding ship arrivals are scheduled. The information about the ship's characteristics is stored for further processing. When all gantry cranes are idle and the previous ship has already departed, the queue list is scanned to begin service for the next ship.

When the beginning of service is scheduled, the information about the ship's characteristics is sent to the subroutine in charge of creating the containers.

Beginning of service (ships):

The beginning of service process is handled by SHIP_BEGSV, which calls the subroutine in charge of creating the containers. In addition, SHIP_BEGSV schedules container retrieval according to their priority.

Creation of containers:

The simulation system allows the user to specify the characteristics of the containers to be created. Specifically, the user can specify the fractions of containers of each kind and dwelling times for high and low-priority containers.

A set of subroutines may be used depending on the operational policy being tested. They differ in the way they locate high-priority containers on the ship. CREATE_RANDOM locates randomly high-priority containers on the ship. CREATE_HOT_HATCH locates high-priority containers in specific hatches (i.e., hot hatches).

After the containers are created, the control of the program is transferred to the subroutine in charge of simulating the unloading process.

Lot assignment:

After the containers on ship have been created, the lot assignment process takes place. By virtue of this process the ship hatches are assigned to specific destination lots on the storage yard.

Two lot assignment schemes are available. The first one is modelled by the subroutine RANDOM_LOTDST_TR. In this case, the yard lots have the same probability of being assigned to a particular hatch, a totally random assignment. This represents a very

inefficient assignment because it does not consider, for instance, that two gantry cranes sending containers to the same yard crane will cause the yard crane to spend a significant amount of time in repositioning.

The second assignment scheme overcomes this problem by assigning to the set of hatches served by the same gantry crane, the set of yard lots served by a randomly selected yard crane. In this way, by assigning in blocks, it is guaranteed that the gantry cranes are feeding only one yard crane at the time, which is more realistic. This partially random assignment scheme is handled by subroutine RANDOM_LOTDST_PR.

Gantry crane operations:

The subroutines in charge of simulating gantry crane operations estimate the corresponding service times according to the operational rules specified in their source code. GCRANE_BASE simulates the operational rules for the base case, in which the containers are evenly unloaded from top to bottom, regardless of priority. GCRANE_PRIOR1 simulates the operational rules for cases in which the gantry crane operator unloads high-priority containers first. Low-priority containers are unloaded only after all high-priority containers have been unloaded from the hatch.

Yard truck operations:

It is assumed that the yard trucks serve all gantry cranes. Whenever a gantry crane needs a yard truck, the first yard truck of the pool of trucks moves over. When the container is loaded onto the truck, the end of service event (ENDSV) is scheduled for the gantry crane and a beginning of service (BEGSV) is scheduled for the truck.

When processing a beginning of service event for the yard trucks:

1) the simulation system determines the destination lot for the container. The destination lot is a function of the hatch number.

2) a suitable slot is found in the corresponding yard lot. A suitable slot meets the following requirements: (a) it is close to the current position of the corresponding yard crane (if present in the lot) and (b) it is empty and not reserved for another container. When a suitable slot is found, it is reserved so that other containers cannot use it.

3) the links connecting the origin and destination nodes are updated to represent both the current truck location and the future container location. Then, the shortest paths are calculated from the origin node (current truck position) to the destination node (slot assigned to the container) and from the destination node to the node representing the pool of trucks. The travel times from origin to destination node will be used to schedule the

arrivals at the storage yard, while the travel times from the destination node to the pool of trucks will be used to schedule the end of the truck's reposition.

Yard operations:

Yard operations are quite complex because yard cranes interact with several processes. First, yard cranes are the last link of the unloading process. Secondly, they are a key component of the container retrieval process. Thirdly, they are in charge of reorganizing the storage yard. The current version of the simulation system includes only the first two roles of yard cranes.

The operational rules implemented in the simulation system are the following:

1) unloading has a higher priority than container retrieval. External trucks arriving to retrieve containers are served only after all yard trucks (loaded with containers unloaded from the ship) are served.

2) service is non-preemptive. If a yard truck needs to be unloaded while the yard crane is serving an external truck, the yard truck waits until the yard crane finishes serving the external truck.

3) matching is performed to guarantee that both truck (external or yard truck) and yard crane are assigned to the same container.

Yard crane allocation rules:

Two yard crane allocation rules are condidered, static and dynamic. Static allocation refers to the case in which the list of yard lots served by a particular yard crane does not change over the simulation. In this case, a yard crane having an extremely long queue will not be helped by idle yard cranes.

In the dynamic allocation scheme, idle yard cranes collaborate in tackling the longest queue. Helping yard cranes are assigned to help a needy yard crane (the one with the longest queue) provided that the queue of the needy yard crane exceeds a given threshold (NM_QL) and the helping yard crane is idle. In this scheme, the allocation is re-assessed at a fixed time interval (T_DA) specified by the user. NM_QL and T_DA are specified in the control file. Since dynamic allocation produces more realistic results it is used in all runs of the simulation system.

Gate operations (in):

When an external truck arrives to retrieve a specific container (the arrival at the gate was scheduled by subroutine SHIP_BEGSV), the external truck is assigned to a gate. If no gate is available, the truck is placed in a queue list.

After processing the truck at the gate, it is necessary to determine if the container is already in its corresponding slot at the storage yard. If the container is in its slot, a beginning of service event is scheduled for the external truck and a request is sent to the corresponding yard crane to retrieve the container. Otherwise, the truck is placed in a queue list to wait for the corresponding yard crane.

First movement of retrieval (gate to storage yard):

When the beginning of service event for this stage is processed, the computer system checks to see if the container is available. If available, the shortest paths from the gate to the storage yard and from the storage yard to the gate are calculated. The arrival at the storage yard is scheduled using the travel time from the gate to the storage yard. If not available, the truck is placed in a queue list.

Match:

Since the yard cranes are assigned to specific lots, arriving trucks (yard trucks or external trucks) must be matched to the corresponding yard crane. Matching requires determining the identification number of the target container, which yard crane is assigned to the container lot and which truck is delivering or retrieving the target container. After both servers (truck and yard crane) are identified, it is necessary to determine their status. If one of the servers is BUSY or REPOSITIONING, the other server waits. When both servers are available to serve the target container, the "old server" transfers the target container to the "new server." Thus an end of service event is scheduled for "old server" and a beginning of service is scheduled for "new server."

By matching servers, the simulation system is able to provide a realistic representation of port operations. Matching also provides useful cross-statistics (e.g., mean waiting times for yard cranes waiting for trucks and vice versa).

Container retrieval at the storage yard:

Once the yard crane has been assigned to retrieve a particular container, the computer systems simulate all necessary processes. If the yard crane is not located in the corresponding lot, a reposition event is scheduled. If the target container is obstructed by other containers, the system simulates the clearing process. Finally, the target container is loaded on the truck (after proper matching).

Second movement of retrieval (storage yard to gate):

After the yard crane is released, the beginning of service for the second movement of retrieval is scheduled. The travel time from the storage yard to the gate, previously determined, is used to schedule the arrival at the gate.

Gate operations (out):

Upon arrival at the gate, the trucks are assigned to the different gates. If no gate is available, the truck is placed in a queue list. Otherwise the service time is estimated and departure from the port is scheduled.

1.1.2 ECON

ECON is in charge of post-processing the output of the simulation system, PRIOR, to produce economic indicators of performance. This section focuses on providing a brief description of the operational principles ECON uses.

It is important to highlight that ECON does not take into consideration the influence of labour agreements on operational costs. Instead, ECON considers exclusively the direct cost of equipment and labour. The reasons to take this decision are two-fold.

First, although considering labour agreements may lead to potentially more realistic results, considering them may masquerade the relative advantage of different operational systems. For instance, it is common practice to pay the stevedors for the full shift, even if the work is finished in half an hour after the beginning. From this real-life perspective, there is no difference between an operational system that requires the gang to work for the full shift and another more efficient system in which the same job only take half an hour. In this context, the costs estimated by ECON must be interpreted as the long term operational costs.

Second, labour agreements vary significantly from terminal to terminal and, consequently, considering labour agreements on cost calculations are likely to diminish the potential to generalize the conclusions of this research.

The following paragraphs provide brief descriptions of the elements considered in the cost calculations. In general terms, costs are calculated for the different types of equipment, namely, ship, gantry cranes, yard cranes, gates (in and out), and external trucks (in and out). Additionally, costs are broken down by server status, namely, idle, busy, repositioning, waiting for another server.

Ship costs:

The ship costs are comprised of the fixed cost of the ship, plus the direct cost associated with the service. The latter component was calculated by assuming that two longshoremen and two lashers are required for each gantry crane, plus one lash leader.

The service and the waiting time for the ship, in conjunction with the unit ship costs and unit service costs, are used to calculate the total unit cost per container.

Gantry cranes, yard trucks, yard cranes, external trucks and gates:

Using the output of the simulation system, the time the servers spend in each status (i.e., busy, idle, repositioning and waiting) is determined. The corresponding total costs are calculated by using the unit costs of operating the server (equipment + labour). Then, the unit costs for each status are calculated by dividing total costs by the output, measured in containers.

1.2 PRIOR: COMPUTATIONAL STRUCTURE

PRIOR has a hierarchy structure. The system was written in FORTRAN and is comprised of more than 16,000 instructions and more than 150 different subroutines. PRIOR is based on the next event approach. Figures 1.4 and 1.5 show some examples of subroutines at different levels of the hierarchy.

Figure 1.4 First level of subroutines
(called by main program)

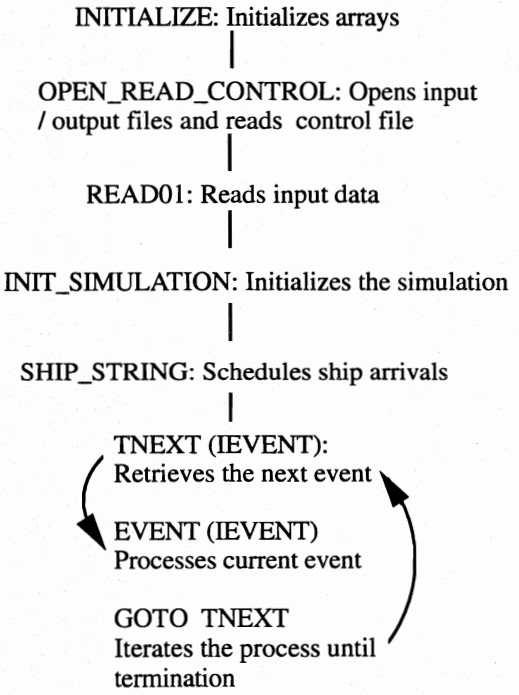
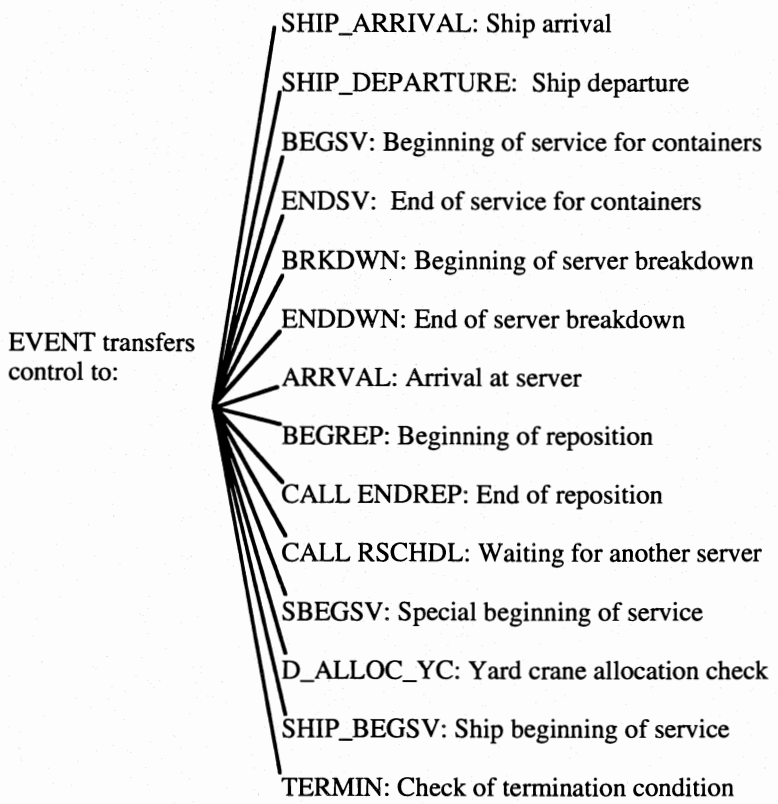


Figure 1.5 show some of the subroutines that are in the second and third level of the hierarchy. In most of the cases these subroutines are in charge of processing the different events, transferring control to the corresponding subroutine.

Figure 1.5 Second and third level of subroutines



The subroutines at the third level are called by second level subroutines to perform different functions. The subroutines called by the subroutine in charge of processing beginning of service (BEGSV), for instance, estimate service times for the different service stages.

Figure 1.5 -cont.-
-Third level-

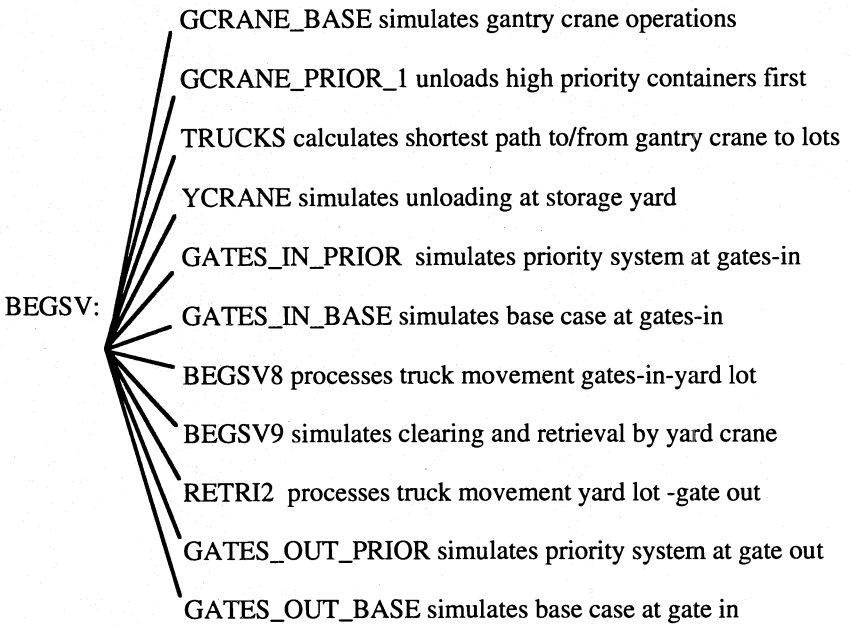
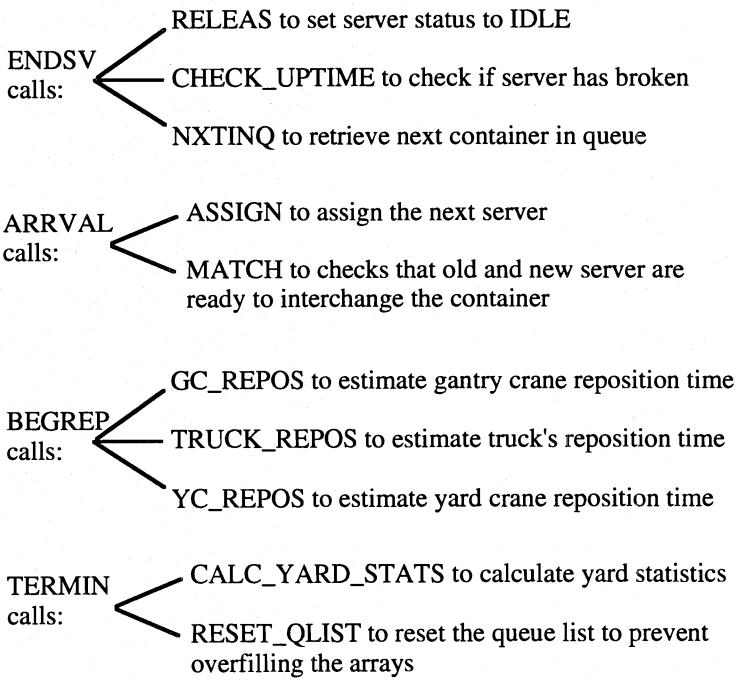


Figure 1.5 -cont.-
-Third level-



1.3 PRIOR: DESCRIPTION OF INPUT AND OUTPUT FILES

The simulation system reads the variables and parameters controlling the run from an ASCII control file called CONTROL.DAT. The control file is comprised of five different sections. The first section provides the program with the parameters that specify the operational policy. The second section contains the global control parameters. The third and fourth sections focus on the specification of input and output files, respectively. The fifth section contains the parameters that specify the printing interval. A typical control file is shown in Table 1.1.

Table 1.1: Typical control file

```
FILE: CONTROL.DAT 24 LOT
TEST CASE MODIFIED

OPERATIONAL PARAMETERS / STAGE                CODE
Creation of containers  (0=B,1=HH)     :        1
Lot assigment           (0=PR,1=TR)    :        0
Gantry crane operations (0=B,1=GC)     :        0
Storage yard operations (0=B,1=SY)     :        1
Yard crane allocation   (0=SA,1=DA)    :        1    5 300.
Gates IN operations     (O=B,1=GI)     :        1
Gates OUT operations    (0=B,1=GO)     :        1


GLOBAL CONTROL PARAMETERS:
Random numbers seed (odd < 2147483647)    7234585
Time scale factor (>1.0,1.0 = seconds):      1.00
Scale factor for composite ID number  :  10000.00
Time to schedule new check            :   5000.00
Clock-time to FORCE TERMINATION       :      0.00
Batch size (number of ships/batch)    :         1
Number of batches (observations)      :        20


INPUT FILES:                              FILENAME
File with char's of bulk arrivals     : BADATA.DAT1
File with string of ships             : SHIPS.DAT0
File with yard geometry               : GEDATA.24LOT
File with list of high priority lots  : HP_LOT.14HPL
File with TRUCK network               : NWORKT.24LOT
File with YARD CRANE network          : NWORKY.24LOT
File with structure of simulation     : ORDER.24LOT
File with char's of gantry cranes     : SDATA1.24LOT
File with char's of yard cranes       : SDATA2.24LOT
File with initial config of STOREY    : STOREY.24LOT
File with the store/queue indexes     : STINDX.24LOT
File with titles for PRNT2B           : TSTAG.24LOT
```

```
File with titles for PRN2C and E      : TSERV.24LOT
File with titles for PRNT14           : TQ26.24LOT
Information on BRKDWN and ABNORMAL obs: BRKDWN.24LOT


OUTPUT FILES                                FILENAME       PRINT CODE
A) Non-discretionary files
Summary of statistics/batch (prior. 1): OUT_P1.HHSYG
Summary of statistics/batch (prior. 2): OUT_P2.HHSYG
File with simulation statistics       : OUT.HHSYG            1
Input file for ECONOMICS              : ECON.HHSYG
Server status (servers 1 to 30)       : STATUS.OUTA
Server status (servers 31 to 60)      : STATUS.OUTB
Server status (servers 61 to 90)      : STATUS.OUTC
B) Discretionary files:
File with EVENT list and transactions : X.OUT                0
5
File with yard crane allocation       : D_ALLOC.OUT          0
File with evolution of storage yard   : STOREY.OUT          0
File with evolution of queues         : Q2.OUT               0
File with waiting/service etc. times  : TWAIT.OUT           0
File with yard crane positions        : YCPOS.OUT            0
Evolution of containers on ship       : ONSHIP.OUT           0
Evolution of stack height             : YARD.OUT             1
Transactions for TARGET container     : TARGET.OUT           0


CONTROL PARAMETERS FOR THE PRINTING INTERVAL:
Lower bound for the simulation clock  :    28900.
Upper bound for the simulation clock  :  2491000.
Lower bound for I coord./storage yard :        41
Upper bound for I coord./storage yard :        50
Lower bound for J coord./storage yard :        30
Upper bound for J coord./storage yard :        35
```

1.3.1 Operational Parameters

These parameters specify the operational characteristics of different service stages. Table 1.2 shows the available options for the different service stages.

Table 1.2: Operational parameters / service stages	
Stage	**Operational parameter**
Creation of containers	0: Randomly located 1: Hot hatches
Lot assigment (hatch to yard lots)	0: Partially random 1: Totally random
Gantry crane operations	0: Base system 1: Priority 1 unloaded first
Yard crane operations	0: Base system 1: Priority lots
Yard crane allocation scheme	0: Static allocation 1: Dynamic allocation. If selected, specify NM_QL and T_DA
Yard gates (IN and OUT)	0: Base system 1: Priority service

1.3.2 Global Control Parameters

This set of parameters controls the program execution in its entirity. The "random number seed" specifies the starting point for the generation of pseudo random numbers. The "time scale factor" allows the use of time units different than seconds (i.e., the default). The "scale factor for composite ID" refers to the constant used to encode integers into real numbers, reducing memory requirements.[1] "Time to schedule new check" refers to the time between consecutive checks of the termination condition. In addition to checking for termination, storage yard statistics are calculated at these break points. "Clock-time to FORCE TERMINATION," if different than zero, specifies the clock time after which program execution is cancelled. This parameter may be used to prevent the program from running indefinitely. "Batch size" represents the number of ships that will form one observation. "Number of batches" is the number of observations that will be generated by the program. When the number of ships that have been unloaded surpasses the number of batches specified by the user, the simulation system closes all files and terminates the run.

1.3.3 Input Files

In its current version, fifteen different input files provide the program with the detailed information the program needs. Since most of the file's contents are self-explanatory only a brief description will be provided here.

---

[1] By using a suitable scale (e.g., 10,000) two integers (i.e., stage and server, priority level and container number) can be combined into a real number, reducing memory requirements. For instance, the number 1.0029 refers to stage 1 and server 29.

The first file contains the ship characteristics (e.g., maximum number of containers, maximum number of containers per hatch and number of containers on deck) and the geometric information about the gantry cranes (e.g., height). The second file contains the ships' string (and their characteristics) expected to call at the port. Since the simulation repeats the ships' string to generate the specified number of observations, the ship's string should be representative of the situation under analysis. The third file specifies the geometric characteristics of the storage yard. The information provided by this file is used to calculate link lengths and link travel times associated with truck and yard crane networks. The fourth file contains the list of high priority lots. The fifth and sixth file provide the morphology of truck and yard crane network, respectively. The seventh file contains the structure of the simulation network (i.e., the server's identification number, the stage to which the server belongs and the type of operation). The eigth and ninth files contain the characteristics of gantry and yard cranes respectively (e.g., job assignment, initial location of cranes). The tenth file provides the initial configuration of the storage yard, in terms of the number of containers stacked at each coordinate. The eleventh file specifies the memory locations in which the simulation statistics and the queue list will be collected and maintained. The last three files provide the titles and headers that will be used in the printout.

1.3.4 Output Files

The specification of the simulation output requires two sets of variables, file names and print codes. Output file names must be specified according to user's needs to avoid overwriting old outputs. Print codes specify whether or not the output file will be generated and its format.

The output files can be classified into two groups, non-discretionary and discretionary. The former is related to output files that, because of their importance, will always be created, though in different formats. The latter group is related to output files that are not essential to the simulation system, thus the user may decide not to create them. If the corresponding print code is equal to 0, the file is not created, otherwise it is. The print code works in conjunction with other variables controlling the output.

Table 1.3 shows the diffferent print codes for non-discretionary output files. Table 1.4 shows the print codes and other variables controlling the output of discretionary files.

Table 1.3 Print codes for non-discretionary output files	
File:	**Print code:**
Summary of statistics priorities 1 and 2	(not applicable)
Simulation statistics	1: Service and waiting times 2: Service and waiting times + server statistics 3: Service and waiting times + server statistics + cross statistics
Server status	(not applicable)

Table 1.4 Print codes and parameters of discretionary output files	
File:	**Print code:**
Evolution of event list	1: Printout, 0: No printout + Bounds for simulation clock (User must specify number of lines)
Evolution of storage yard	1: Printout, 0: No printout + Bounds for simulation clock + Bounds for yard section to print
Evolution of the queues	1: Printout, 0: No printout + Bounds for simulation clock
Time transactions (e.g. waiting times)	1: Printout, 0: No printout + Bounds for simulation clock
Evolution of yard crane position	1: Printout, 0: No printout + Bounds for simulation clock
Evolution of containers on ship	1: Printout, 0: No printout + Bounds for simulation clock
Evolution of stack height	1: Printout, 0: No printout + Bounds for simulation clock
Transactions for target container	0: No printout Printout, if container number is specified

1.3.5 Control Parameters for the Printing Interval

Since the output size may be extremely large, it is necessary to restrict the output to a manageable size. Two sets of additional parameters help to keep the output size to a manageable size. The first of them consists of lower and upper bounds to the simulation clock. As shown in Table 1.4, the bounds for the simulation clock control the printout of all discretionary output files. The specified output files will be printed for the clock range in between the two bounds. In addition, the storage yard output file requires the specification of the initial and final coordinate of the storage yard section to be printed. By doing this, the user may specify the printout of a particular lot of the entire storage yard.

1.4 ECON: COMPUTATIONAL STRUCTURE

The computational structure of ECON is relatively simple. The main program initializes the arrays and reads the file containing the information about unit costs. The unit costs are stored and the input file produced by PRIOR is read, beginning with high priority containers. The data is transferred to the subroutine CALC_COSTS which calculates the corresponding operating costs. The process is repeated for low priority containers. Then the output file containing operating costs for both priorities is printed. The process is repeated for all observations.

1.5 ECON: DESCRIPTION OF INPUT AND OUTPUT FILES

ECON uses two input files. The first one is the output of the simulation provided by PRIOR and the second is the control file containing economic information about equipment and labour costs (ECON.DAT). The unit costs for labour and equipment were taken from "Assessment of Cargo Handling Technology" (PRC93), written for the Maritime Administration. The output of ECON consist of two files containing detailed costs and a summary of results, respectively. Table 1.5 shows a typical input file.

Table 1.5 Typical control file (ECON.DAT)

```
FILE: ECON.DAT
It contains data corresponding to economic information
in two sections: a) equipment costs and b) gangs

A) CONTROL INFORMATION
 Input file (from PRIOR)              : ECON.HHDA3
 Output file containing detailed costs: ECON.OUT
 Output file containing summary       : ECON.SUM

B) FINANCIAL COSTS:
 Opportunity cost (%/year)      (RATE):      0.12
 Cargo value. Priority 1 ($/t)   (CV1): 10000.00
 Cargo value. Priority 2 ($/t)   (CV2):  1000.00
 Weight of 40' container (t)  (WEIGHT):    20.00

C) EQUIPMENT HOURLY COSTS ($/hour):
 Ship                           (SH_C):  3125.00
 Gantry crane                   (GC_C):   410.00
 Yard crane                     (YC_C):   250.00
 Yard trucks/external trucks    (YT_C):    15.00

D) LABOUR COSTS ($/hour):
 Gantry crane operator          (GC_L):    73.66
 Yard crane operator            (YC_L):    73.66
 Longshoreman                   (LO_L):    65.51
 Foreman                        (FO_L):    94.88
 Yard trucks                    (YT_L):    67.25
```

```
Clerk                          (CL_L):     65.51
Checker                        (CH_L):     65.51
SuperCargo                     (SU_L):     89.04
Lash leader                    (LL_L):     86.52
Lasher                         (LA_L):     65.51
Top lift/Straddle c. driver    (TL_L):     67.25
Repair time                    (RE_L):    150.00
```

1.6 USEFUL HINTS

This section focuses on presenting a set of hints that will make using the program easier and will reduce the number of errors in creating the input data files.

1.6.1 About Coding the Truck Network

a) The links and node representing the gantry crane position must be numbered first before the rest of the network.

b) It must be remembered that the truck network is a directed network. Thus, the links representing turning movements at intersections must be included, otherwise the network will not be correctly represented.

1.6.2 About the File Containing the Queue and Storing Indexes

This file, named STINDX.DAT in the example, is of vital importance because it controls the queue list (through INDXQL) and tells the program where to store the statistics of the simulation (using INDXST). Thus, great care must be taken in its preparation.

a) The servers must be numbered consecutively according to the stage (in order to be consistent with the way the statistics are collected and printed). The order of the different servers is:

- Gantry cranes
- Yard trucks
- Yard cranes (stage 3)
- Gates -in-
- External trucks -in-
- Yard cranes (stage 9)
- External trucks -out-
- Gates -out-

b) The server number for "External trucks -in-" and "External trucks -out-" has been set equal to the number of servers plus two.

"External trucks -in-" and "External trucks -out-" do not have queue list (because they do not have any queues), input 99 on the field corresponding to queue list.

c) The INDXSTs for "Yard cranes (stage 9)" have to be numbered leaving one number between consecutive servers. This index will be used internally by the program to collect the statistics on truck waiting times.

d) The server numbers for "Yard cranes (stage 3)" and "Yard cranes (stage 9)" must be the same since they are the same servers. The queue_list and stats_list may be different, though.

e) The current version of PRIOR does not consider separately trucks and orders for stage 3. For that reason, only one INDXST is needed for each "Yard cranes (stage 3)," as opposed to two for each "Yard cranes (stage 9)."

f) The number of gantry cranes and yard cranes must be consistent with SDATA1 and SDATA2, respectively.

CHAPTER 2. EXAMPLE

In this section an example of a typical application of PRIOR is presented, which is intended to provide additional information about the particulars of this unique piece of software.

Subsection 2.1 focuses on the general characteristics of the test case. Subsection 2.2 presents the corresponding input and output files.

2.1 DESCRIPTION OF EXAMPLE

The general characteristics of the example are as follows:

a) Containers on ship: high and low priority containers are randomly located on the ship.

b) Gantry crane operations: high and low priority containers are unloaded from top of the hatch to bottom, regardless of their priority. Three gantry cranes are used to unload the ships.

c) Yard truck operations: yard truck operations are the same for both priorities. When the container is unloaded from the ship, the destination lot is determined as a function of the hatch number. Twenty four yard trucks move the containers from the ship to the storage yard.

d) Gate operations (in and out): all containers are treated in the same way and, consequently, the service time distributions for both priorities are the same. Eight inbound lanes and eight outbound lanes serve the trucks.

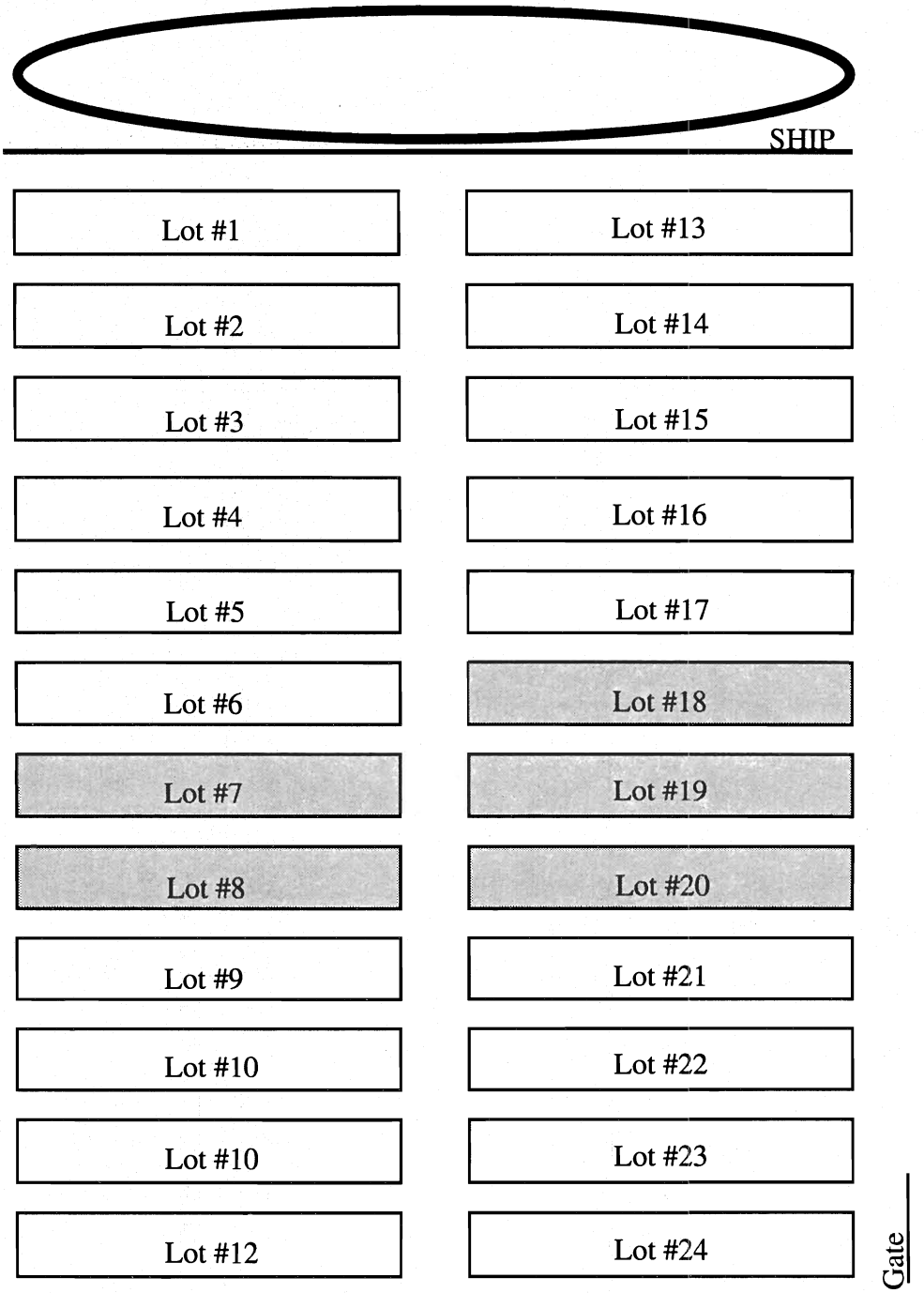
e) External truck operations (gate-to-yard lot and yard lot-to-gate): the external trucks have the same operational characteristics for both priorities. The only difference between the two groups is their arrival time at the terminal. [2]

f) Yard operations: stacked operations are assumed for all containers, regardless of priority level. No special treatment is given to high priority containers. The storage yard is comprised of twenty four yard lots. Each lot is capable of storing two hundred and forty containers (10x6x4). The lots are served by six yard cranes. Figure 2.1 shows the yard configurations used in this research.

---

[2] Trucks arriving to retrieve high priority containers have scheduled arrivals between six and ten hours after ship arrival. On the other hand, trucks retrieving low priority containers have scheduled arrivals in the interval between two and seven days after ship arrival.

Figure 2.1: Yard configurations used



2.2 PRIOR: TYPICAL INPUT FILES

In this section the input files corresponding to the example are presented. To facilitate the identification of the column numbers in which the control parameters are located, a two line ruler containing the column numbers has been added to each input file. This ruler is not part of the input files and must be removed before using the files.

2.2.1 CONTROL.DAT

```
000000000111111111122222222223333333333444444444455555555556666666
123456789012345678901234567890123456789012345678901234567890123456789012345
 FILE: CONTROL.DAT
 TEST CASE

 OPERATIONAL PARAMETERS / STAGE                CODE
 Creation of containers  (0=B,1=HH)     :         0
 Lot assigment           (0=PR,1=TR)    :         0
 Gantry crane operations (0=B,1=GC)     :         0
 Storage yard operations (0=B,1=SY)     :         0
 Yard crane allocation   (0=SA,1=DA)    :         1    5 300.
 Gates IN operations     (O=B,1=GI)     :         0
 Gates OUT operations    (0=B,1=GO)     :         0


 GLOBAL CONTROL PARAMETERS:
 Random numbers seed (odd < 2147483647)    9934585
 Time scale factor (>1.0,1.0 = seconds):      1.00
 Scale factor for composite ID number   :  10000.00
 Time to schedule new check             :   5000.00
 Clock-time to FORCE TERMINATION        :      0.00
 Batch size (number of ships/batch)     :         1
 Number of batches (observations)       :         5


 INPUT FILES:                              FILENAME
 File with char's of bulk arrivals      : BADATA.DAT1
 File with string of ships              : SHIPS.DAT2
 File with yard geometry                : GEDATA.24LOT
 File with list of high priority lots   : HP_LOT.8HPL
 File with TRUCK network                : NWORKT.24LOT
 File with YARD CRANE network           : NWORKY.24LOT
 File with structure of simulation      : ORDER.24LOT
 File with char's of gantry cranes      : SDATA1.24LOT
 File with char's of yard cranes        : SDATA2.24LOT
 File with initial config of STOREY     : STOREY.24LOT
 File with the store/queue indexes      : STINDX.24LOT
 File with titles for PRNT2B            : TSTAG.24LOT
 File with titles for PRN2C and E       : TSERV.24LOT
 File with titles for PRNT14            : TQ26.24LOT
 Information on BRKDWN and ABNORMAL obs: BRKDWN.24LOT
```

```
OUTPUT FILES                                FILENAME       PRINT CODE
A) Non-discretionary files
Summary of statistics/batch (prior. 1): OUT_1.EXAM
Summary of statistics/batch (prior. 2): OUT_2.EXAM
File with simulation statistics       : OUT.EXAM            1
Input file for ECONOMICS               : ECON.EXAM
Server status (servers 1 to 30)        : STATUS.OUTA
Server status (servers 31 to 60)       : STATUS.OUTB
Server status (servers 61 to 90)       : STATUS.OUTC
B) Discretionary files:
File with EVENT list and transactions : X.OUT               0     5
File with yard crane allocation        : D_ALLOC.OUT        0
File with evolution of storage yard    : STOREY.OUT         0
File with evolution of queues          : Q2.OUT             0
File with waiting/service etc. times   : TWAIT.OUT          0
File with yard crane positions         : YCPOS.OUT          0
Evolution of containers on ship        : ONSHIP.OUT         0
Evolution of stack height              : YARD.OUT           0
Transactions for TARGET container      : TARGET.OUT         0


CONTROL PARAMETERS FOR THE PRINTING INTERVAL:
Lower bound for the simulation clock  :   644800.
Upper bound for the simulation clock  :  8600111.
Lower bound for I coord./storage yard :        41
Upper bound for I coord./storage yard :        50
Lower bound for J coord./storage yard :        30
Upper bound for J coord./storage yard :        35
```

2.2.2 BADATA.DAT1

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: BADATA.DAT1
 It contains data about bulk arrivals of containers.


 Max number of containers in X,Y,Z/ship     20.000     5.000    10.000
 Max number of containers in X,Y,Z/hatch     1.000     5.000    10.000
  Dimensions of container 1-A (40 foot)     12.192     2.438     2.438
           Empty positions (enter 0.00)      0.000     0.000     0.000
  Distance: truck to base of crane (ms)     12.250
  Distance: base of crane to berth (ms)      2.000
  Distance: edge of  berth to ship (ms)      1.000
            Empty position (enter 0.00)      0.000
            Empty position (enter 0.00)      0.000
            Empty position (enter 0.00)      0.000
  Distance: berth  to top of hatch (ms)      8.000
  Distance: berth to max. lifting  (ms)     25.150
            Empty position (enter 0.00)      0.000
            Empty position (enter 0.00)      0.000
            Empty position (enter 0.00)      0.000
     Number of container layers On Deck      3.000
   Number of extra layers of containers      1.000
```

2.2.3 SHIPS.DAT2

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: SHIPS.DAT2 (1 SHIP/WEEK and %HPC = 50%)
 It contains the characteristics of the ships arriving at the port.


 Number of ships in this string                2
 Time between ship strings (days)            7.0
 Ship # 1                                    0.0 0.50 0.50
 Ship # 2                                    7.0 0.50 0.50
```

2.2.4 GEDATA.24LOT

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: GEDATA.24LOT
 It contains data about the geometry of the storage yard
 and storage yard operations.
```

Max number of containers in X,Y,Z/yard	80.000	84.000	4.000
Max number of conts X,Y,Z/lot STACKED	10.000	7.000	4.000
Max number of conts X,Y,Z/lot WHEELED	40.000	2.000	1.000
Empty positions (enter 0.00)	0.000	0.000	0.000
Empty positions (enter 0.00)	0.000	0.000	0.000
Empty positions (enter 0.00)	0.000	0.000	0.000
Dimensions of container 1-A (40 foot)	12.192	2.438	2.438
Empty positions (enter 0.00)	0.000	0.000	0.000
Coordinates of berthing point (X,Y)	10.250	0.000	
Axis to network distance (X,Y)	5.000	5.000	
Number of lots (X,Y)	2.000	12.000	
Lot dimension (mts) (X,Y)	121.920	17.066	
Empty positions (enter 0.00)	0.000	0.000	
Number of extra layers of containers	2.000		
Apron width (mts)	20.000		
Lane width (mts)	3.500		
Stopping lane width (mts)	2.500		
Truck speed (mt/sec)	6.944		
Driveway width between wheeled lots	20.000		

2.2.5 HP_LOT.8HPL

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: HP_LOT.8HPL
 It contains the list of priority lots. The destination
 lot is randomly assigned for low priority containers

 Number of priority lots:                          8
                    Priority lot number            9
                    Priority lot number           10
                    Priority lot number           11
                    Priority lot number           12
                    Priority lot number           21
                    Priority lot number           22
                    Priority lot number           23
                    Priority lot number           24
```

2.2.6 NWORKT.24LOT

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: NWORKT.24LOT
 It contains the structure of the truck network
 Use one line for each link

 Node corresponding to pool of trucks     152
   Number of nodes + 5; Number of links   400  445
         Gate node numbers (IN and OUT)    49   48
 Param`s for random links (o.w. use 99.)  99.  99.  99.
   Start Node, End Node, Link code, Lot     1   51    1    1
   Start Node, End Node, Link code, Lot   151    1    1    1
   Start Node, End Node, Link code, Lot    14  152    1    2
   Start Node, End Node, Link code, Lot   301   14    1    2
   Start Node, End Node, Link code, Lot    49  245    2   12
   Start Node, End Node, Link code, Lot    49  247    4   12
   Start Node, End Node, Link code, Lot    49  249    3   12
   Start Node, End Node, Link code, Lot    50   53    7    1
   Start Node, End Node, Link code, Lot    50   55    6    1
   Start Node, End Node, Link code, Lot    51   50    2    1
   Start Node, End Node, Link code, Lot    52    2    1    1
   Start Node, End Node, Link code, Lot     2  150    1    1
   Start Node, End Node, Link code, Lot    53   52    3    1
   Start Node, End Node, Link code, Lot    54   61    6    2
   Start Node, End Node, Link code, Lot    55   54    4    2
   Start Node, End Node, Link code, Lot    55   58    2    2
   Start Node, End Node, Link code, Lot    56   53    6    1
   Start Node, End Node, Link code, Lot    57   54    2    2
   Start Node, End Node, Link code, Lot    57   56    3    2
   Start Node, End Node, Link code, Lot    58    3    1    2
   Start Node, End Node, Link code, Lot     3  156    1    2
   Start Node, End Node, Link code, Lot    59   56    4    2
   Start Node, End Node, Link code, Lot    59   58    3    2
   Start Node, End Node, Link code, Lot    60   67    6    3
   Start Node, End Node, Link code, Lot    61   60    4    3
   Start Node, End Node, Link code, Lot    61   64    2    3
   Start Node, End Node, Link code, Lot    62   59    6    2
```

Start Node,	End Node,	Link code,	Lot	63	60	2	3
Start Node,	End Node,	Link code,	Lot	63	62	3	2
Start Node,	End Node,	Link code,	Lot	64	4	1	3
Start Node,	End Node,	Link code,	Lot	4	164	1	3
Start Node,	End Node,	Link code,	Lot	65	62	4	3
Start Node,	End Node,	Link code,	Lot	65	64	3	3
Start Node,	End Node,	Link code,	Lot	66	73	6	4
Start Node,	End Node,	Link code,	Lot	67	66	4	4
Start Node,	End Node,	Link code,	Lot	67	70	2	4
Start Node,	End Node,	Link code,	Lot	68	65	6	3
Start Node,	End Node,	Link code,	Lot	69	66	2	4
Start Node,	End Node,	Link code,	Lot	69	68	3	3
Start Node,	End Node,	Link code,	Lot	70	5	1	4
Start Node,	End Node,	Link code,	Lot	5	172	1	4
Start Node,	End Node,	Link code,	Lot	71	68	4	4
Start Node,	End Node,	Link code,	Lot	71	70	3	4
Start Node,	End Node,	Link code,	Lot	72	79	6	5
Start Node,	End Node,	Link code,	Lot	73	72	4	5
Start Node,	End Node,	Link code,	Lot	73	76	2	5
Start Node,	End Node,	Link code,	Lot	74	71	6	4
Start Node,	End Node,	Link code,	Lot	75	72	2	5
Start Node,	End Node,	Link code,	Lot	75	74	3	5
Start Node,	End Node,	Link code,	Lot	76	6	1	5
Start Node,	End Node,	Link code,	Lot	6	180	1	5
Start Node,	End Node,	Link code,	Lot	77	74	4	5
Start Node,	End Node,	Link code,	Lot	77	76	3	5
Start Node,	End Node,	Link code,	Lot	78	85	6	6
Start Node,	End Node,	Link code,	Lot	79	78	4	6
Start Node,	End Node,	Link code,	Lot	79	82	2	6
Start Node,	End Node,	Link code,	Lot	80	77	6	5
Start Node,	End Node,	Link code,	Lot	81	80	3	5
Start Node,	End Node,	Link code,	Lot	81	78	2	6
Start Node,	End Node,	Link code,	Lot	82	7	1	6
Start Node,	End Node,	Link code,	Lot	7	188	1	6
Start Node,	End Node,	Link code,	Lot	83	80	4	6
Start Node,	End Node,	Link code,	Lot	83	82	3	6
Start Node,	End Node,	Link code,	Lot	84	91	6	7
Start Node,	End Node,	Link code,	Lot	85	84	4	7
Start Node,	End Node,	Link code,	Lot	85	88	2	7
Start Node,	End Node,	Link code,	Lot	86	83	6	6
Start Node,	End Node,	Link code,	Lot	87	84	2	7
Start Node,	End Node,	Link code,	Lot	87	86	3	7
Start Node,	End Node,	Link code,	Lot	88	8	1	7
Start Node,	End Node,	Link code,	Lot	8	196	1	7
Start Node,	End Node,	Link code,	Lot	89	86	4	7
Start Node,	End Node,	Link code,	Lot	89	88	3	7
Start Node,	End Node,	Link code,	Lot	90	96	6	8
Start Node,	End Node,	Link code,	Lot	91	90	4	8
Start Node,	End Node,	Link code,	Lot	91	94	2	8
Start Node,	End Node,	Link code,	Lot	92	89	6	7
Start Node,	End Node,	Link code,	Lot	93	90	2	8
Start Node,	End Node,	Link code,	Lot	93	92	3	8
Start Node,	End Node,	Link code,	Lot	94	9	1	8
Start Node,	End Node,	Link code,	Lot	9	204	1	8
Start Node,	End Node,	Link code,	Lot	95	92	4	8

Start Node,	End Node,	Link code,	Lot
95	94	3	8
96	99	2	9
96	101	4	9
97	95	6	8
98	97	3	9
98	101	2	9
99	10	1	9
10	212	1	9
100	97	4	9
100	99	3	9
101	102	6	9
102	105	2	10
102	107	4	10
103	100	6	9
104	103	3	10
104	107	2	10
105	11	1	10
11	220	1	10
106	103	4	10
106	105	3	10
107	108	6	10
108	113	4	11
108	111	2	11
109	106	6	10
110	109	3	11
110	113	2	11
111	12	1	11
12	228	1	11
112	109	4	11
112	111	3	11
113	114	6	11
114	117	2	11
114	119	4	11
115	112	6	11
116	115	3	12
116	119	2	12
117	13	1	12
13	236	1	12
118	115	4	12
118	117	3	12
119	120	6	12
120	123	2	12
121	118	6	12
122	121	3	12
123	244	5	12
150	153	4	1
150	155	3	1
152	151	4	1
152	155	2	1
153	15	1	13
15	300	1	13
154	151	2	1
154	153	3	1
155	158	6	1
156	159	2	1

Start Node,	End Node,	Link code,	Lot	156	161	4	1
Start Node,	End Node,	Link code,	Lot	156	163	3	1
Start Node,	End Node,	Link code,	Lot	157	57	5	2
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202	201	3	7
203	206	6	7
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204	209	4	8
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206	211	4	8
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246	48	4	12
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247	242	6	12
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49	247	4	12
49	249	3	12
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306	305	3	14
306	309	4	14
307	302	6	13
308	305	2	14
308	307	4	14
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311	168	5	15
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312	315	4	15
313	308	6	14

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Start Node,	End Node,	Link code,	Lot	349	344	6	20
Start Node,	End Node,	Link code,	Lot	350	347	2	21

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  Start Node, End Node, Link code, Lot   370  373    2   24
  Start Node, End Node, Link code, Lot   371  248    5   24
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  Start Node, End Node, Link code, Lot   373  368    6   24
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2.2.7 NWORKY.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: NWORKY.24LOT
 It contains the structure of the yard crane network
 Use one line for each link

      Number of nodes; Number of links   200  206
 Param`s for random links (o.w. use 99.)  99.  99.   99.
  Start Node, End Node, Link code, Lot    51    1    1    1
  Start Node, End Node, Link code, Lot     1  101    1    1
  Start Node, End Node, Link code, Lot    51   52    3    1
  Start Node, End Node, Link code, Lot    52   53    2    2
  Start Node, End Node, Link code, Lot    53   54    3    2
  Start Node, End Node, Link code, Lot    53   55    4    2
  Start Node, End Node, Link code, Lot    54    2    1    2
  Start Node, End Node, Link code, Lot     2  104    1    2
  Start Node, End Node, Link code, Lot    54   55    3    2
  Start Node, End Node, Link code, Lot    55   56    2    3
  Start Node, End Node, Link code, Lot    56   57    3    3
  Start Node, End Node, Link code, Lot    56   58    4    3
  Start Node, End Node, Link code, Lot    57    3    1    3
```

Start Node,	End Node,	Link code,	Lot
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57	58	3	3
58	59	2	4
59	60	3	4
59	61	4	4
60	4	1	4
4	112	1	4
60	61	3	4
61	62	2	5
62	63	3	5
62	64	4	5
63	5	1	5
5	116	1	5
64	65	2	6
65	66	3	6
65	67	4	6
66	67	3	6
66	6	1	6
6	120	1	6
67	68	2	7
68	69	3	7
68	70	4	7
69	70	3	7
69	7	1	7
7	124	1	7
70	71	2	8
71	73	4	8
71	72	3	8
72	8	1	8
8	128	1	8
72	73	3	8
73	74	2	9
74	75	3	9
74	76	4	9
75	9	1	9
9	135	1	9
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78	10	1	10
10	139	1	10
79	80	2	11
80	81	3	11
80	82	4	11
81	11	1	11
11	143	1	11
82	83	2	12
83	12	1	12
12	146	1	12
83	84	3	12
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101	103	3	1
102	103	3	1
102	13	1	13
13	151	1	13

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Start Node,	End Node,	Link code,	Lot	105	106	3	2
Start Node,	End Node,	Link code,	Lot	105	107	4	2
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Start Node,	End Node,	Link code,	Lot	14	153	1	14
Start Node,	End Node,	Link code,	Lot	106	107	3	2
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Start Node,	End Node,	Link code,	Lot	131	132	2	9
Start Node,	End Node,	Link code,	Lot	132	133	3	9
Start Node,	End Node,	Link code,	Lot	132	134	4	9
Start Node,	End Node,	Link code,	Lot	132	135	3	9
Start Node,	End Node,	Link code,	Lot	133	21	1	21
Start Node,	End Node,	Link code,	Lot	21	176	1	21
Start Node,	End Node,	Link code,	Lot	133	134	3	9
Start Node,	End Node,	Link code,	Lot	133	135	4	9
Start Node,	End Node,	Link code,	Lot	134	135	3	9
Start Node,	End Node,	Link code,	Lot	134	136	2	10
Start Node,	End Node,	Link code,	Lot	136	137	3	10
Start Node,	End Node,	Link code,	Lot	136	138	4	10
Start Node,	End Node,	Link code,	Lot	136	139	3	10
Start Node,	End Node,	Link code,	Lot	137	22	1	22
Start Node,	End Node,	Link code,	Lot	22	179	1	22
Start Node,	End Node,	Link code,	Lot	137	138	3	10
Start Node,	End Node,	Link code,	Lot	137	139	4	10
Start Node,	End Node,	Link code,	Lot	138	139	3	10
Start Node,	End Node,	Link code,	Lot	138	140	2	11
Start Node,	End Node,	Link code,	Lot	140	141	3	11
Start Node,	End Node,	Link code,	Lot	140	142	4	11
Start Node,	End Node,	Link code,	Lot	140	143	3	11
Start Node,	End Node,	Link code,	Lot	141	23	1	23
Start Node,	End Node,	Link code,	Lot	23	182	1	23
Start Node,	End Node,	Link code,	Lot	141	142	3	11
Start Node,	End Node,	Link code,	Lot	141	143	4	11
Start Node,	End Node,	Link code,	Lot	142	143	3	11
Start Node,	End Node,	Link code,	Lot	142	144	2	12
Start Node,	End Node,	Link code,	Lot	144	145	3	12
Start Node,	End Node,	Link code,	Lot	144	146	3	12
Start Node,	End Node,	Link code,	Lot	145	24	1	24
Start Node,	End Node,	Link code,	Lot	24	184	1	24
Start Node,	End Node,	Link code,	Lot	145	146	4	12
Start Node,	End Node,	Link code,	Lot	151	152	3	13
Start Node,	End Node,	Link code,	Lot	152	154	2	14
Start Node,	End Node,	Link code,	Lot	153	154	3	14
Start Node,	End Node,	Link code,	Lot	153	155	3	14
Start Node,	End Node,	Link code,	Lot	154	155	4	14
Start Node,	End Node,	Link code,	Lot	155	157	2	15
Start Node,	End Node,	Link code,	Lot	156	157	3	15
Start Node,	End Node,	Link code,	Lot	156	158	3	15
Start Node,	End Node,	Link code,	Lot	157	158	4	15
Start Node,	End Node,	Link code,	Lot	158	160	2	16
Start Node,	End Node,	Link code,	Lot	159	160	3	16
Start Node,	End Node,	Link code,	Lot	159	161	3	16
Start Node,	End Node,	Link code,	Lot	160	161	4	16
Start Node,	End Node,	Link code,	Lot	161	163	2	17

```
Start Node, End Node, Link code, Lot   162  163    3   17
Start Node, End Node, Link code, Lot   162  164    3   17
Start Node, End Node, Link code, Lot   163  164    4   17
Start Node, End Node, Link code, Lot   164  166    2   18
Start Node, End Node, Link code, Lot   165  166    3   18
Start Node, End Node, Link code, Lot   165  167    3   18
Start Node, End Node, Link code, Lot   166  167    4   18
Start Node, End Node, Link code, Lot   167  169    2   19
Start Node, End Node, Link code, Lot   168  169    3   19
Start Node, End Node, Link code, Lot   168  170    3   19
Start Node, End Node, Link code, Lot   169  170    4   19
Start Node, End Node, Link code, Lot   170  172    2   20
Start Node, End Node, Link code, Lot   171  172    3   20
Start Node, End Node, Link code, Lot   171  173    3   20
Start Node, End Node, Link code, Lot   172  173    4   20
Start Node, End Node, Link code, Lot   173  174    2   21
Start Node, End Node, Link code, Lot   174  175    4   21
Start Node, End Node, Link code, Lot   174  176    3   21
Start Node, End Node, Link code, Lot   175  176    3   21
Start Node, End Node, Link code, Lot   175  177    2   22
Start Node, End Node, Link code, Lot   177  178    4   22
Start Node, End Node, Link code, Lot   177  179    3   22
Start Node, End Node, Link code, Lot   178  179    3   22
Start Node, End Node, Link code, Lot   178  180    2   23
Start Node, End Node, Link code, Lot   180  181    4   23
Start Node, End Node, Link code, Lot   180  182    3   23
Start Node, End Node, Link code, Lot   181  182    3   23
Start Node, End Node, Link code, Lot   181  183    2   24
Start Node, End Node, Link code, Lot   183  184    3   24
```

2.2.8 ORDER.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666666 7
123456789012345678901234567890123456789012345678901234567890123456789 0
 FILE: ORDER.24LOT //TEST CASE 3 GC'S;24 TRUCKS;6 YARD CRANES//
 One column/stage:G_CRANES,TRUCKS,Y_CRANES_3 and 9, ATES_IN and OUT
 If more than five stages, leave 4 lines and repeat template

  Number of servers ; Number of stages    49   12
    Service regime (1=simult 0=sequen)     1    0    1    1    1
First server in rotation (0 if simult)     0    4    0    0    0
 Last server in rotation (0 if simult)     0   27    0    0    0
       Number of servers in each stage     3   24    6    8    8
Server list if simult. Next server o.w.    1    0    0    0    0
Server list if simult. Next server o.w.    2    0    0    0    0
Server list if simult. Next server o.w.    3    0    0    0    0
Server list if simult. Next server o.w.    0    5    0    0    0
Server list if simult. Next server o.w.    0    6    0    0    0
Server list if simult. Next server o.w.    0    7    0    0    0
Server list if simult. Next server o.w.    0    8    0    0    0
Server list if simult. Next server o.w.    0    9    0    0    0
Server list if simult. Next server o.w.    0   10    0    0    0
Server list if simult. Next server o.w.    0   11    0    0    0
Server list if simult. Next server o.w.    0   12    0    0    0
Server list if simult. Next server o.w.    0   13    0    0    0
Server list if simult. Next server o.w.    0   14    0    0    0
Server list if simult. Next server o.w.    0   15    0    0    0
```

```
Server list if simult. Next server o.w.    0   16    0    0    0
Server list if simult. Next server o.w.    0   17    0    0    0
Server list if simult. Next server o.w.    0   18    0    0    0
Server list if simult. Next server o.w.    0   19    0    0    0
Server list if simult. Next server o.w.    0   20    0    0    0
Server list if simult. Next server o.w.    0   21    0    0    0
Server list if simult. Next server o.w.    0   22    0    0    0
Server list if simult. Next server o.w.    0   23    0    0    0
Server list if simult. Next server o.w.    0   24    0    0    0
Server list if simult. Next server o.w.    0   25    0    0    0
Server list if simult. Next server o.w.    0   26    0    0    0
Server list if simult. Next server o.w.    0   27    0    0    0
Server list if simult. Next server o.w.    0   99    0    0    0
Server list if simult. Next server o.w.    0    0   28    0    0
Server list if simult. Next server o.w.    0    0   29    0    0
Server list if simult. Next server o.w.    0    0   30    0    0
Server list if simult. Next server o.w.    0    0   31    0    0
Server list if simult. Next server o.w.    0    0   32    0    0
Server list if simult. Next server o.w.    0    0   33    0    0
Server list if simult. Next server o.w.    0    0    0   34    0
Server list if simult. Next server o.w.    0    0    0   35    0
Server list if simult. Next server o.w.    0    0    0   36    0
Server list if simult. Next server o.w.    0    0    0   37    0
Server list if simult. Next server o.w.    0    0    0   38    0
Server list if simult. Next server o.w.    0    0    0   39    0
Server list if simult. Next server o.w.    0    0    0   40    0
Server list if simult. Next server o.w.    0    0    0   41    0
Server list if simult. Next server o.w.    0    0    0    0   42
Server list if simult. Next server o.w.    0    0    0    0   43
Server list if simult. Next server o.w.    0    0    0    0   44
Server list if simult. Next server o.w.    0    0    0    0   45
Server list if simult. Next server o.w.    0    0    0    0   46
Server list if simult. Next server o.w.    0    0    0    0   47
Server list if simult. Next server o.w.    0    0    0    0   48
Server list if simult. Next server o.w.    0    0    0    0   49
```

2.2.9 SDATA1.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: SDATA1.24LOT
 It contains data corresponding to stage 1 (gantry crane)
 Use one column for each crane and as many lines as jobs

                Number of gantry cranes     3
           Server identification number     1    2    3
   Initial coordinate of the crane (I)     1    8   15
   Initial coordinate of the crane (J)     1    1    1
   Initial coordinate of the crane (K)     1    1    1
          Direction of crane movement      1    1    1
                Priority being served      1    1    1
     Job status (1=being done, 0=done)     0    0    0
             Empty positions (enter 0)     0    0    0
             Empty positions (enter 0)     0    0    0
Number of different assignments (jobs)     7    7    6
                        Job number  1      1    8   15
                        Job number  2      2    9   16
```

```
                    Job number  3     3   10   17
                    Job number  4     4   11   18
                    Job number  5     5   12   19
                    Job number  6     6   13   20
                    Job number  7     7   14    0
                    Job number  8     0    0    0
                    Job number  9     0    0    0
                    Job number 10     0    0    0
```

2.2.10 SDATA2.24LOT

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: SDATA2.24LOT
 // NEW TEST CASE // 6 YARD CRANES
 It contains data corresponding to stage 3 (yard crane)
 Use one column for each crane and as many lines as jobs
                Number of gantry cranes     6
            Server identification number   28   29   30   31   32   33
   Initial coordinate of the crane (I)      1    1    1    1    1    1
   Initial coordinate of the crane (J)      1   15   29   43   57   71
   Initial coordinate of the crane (K)      1    1    1    1    1    1
           Direction of crane movement      1    1    1    1    1    1
                 Priority being served      1    1    1    1    1    1
     Job status (1=being done, 0=done)      1    1    1    1    1    1
            Number of lot being served      1    3    5    7    9   11
             Empty positions (enter 0)      0    0    0    0    0    0
 Number of different assignments (jobs)     4    4    4    4    4    4
                         Job number 1       1    3    5    7    9   11
                         Job number 2       2    4    6    8   10   12
                         Job number 3      13   15   17   19   21   23
                         Job number 4      14   16   18   20   22   24
                         Job number 5       0    0    0    0    0    0
```

2.2.11 STOREY.24LOT

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: STOREY.24LOT
 It provides the initial configuration of the storage yard.
 The numbers indicate the stack height for a particular (I,J)
 The user provides FHPC and FLPC
 Fraction of high priority containers  : 0.20
 Fraction of low priority containers   : 0.80
 1 0 3 2 1 0 2 3 1 0
 2 0 0 0 0 0 1 1 1 0
 1 0 3 2 1 0 2 3 1 0
 2 0 0 0 0 0 1 1 1 0
 1 0 3 2 1 0 2 3 1 0
 2 0 0 0 0 0 1 1 1 0
```

2.2.12 STINDX3.24LOT

```
0000000001111111111222222222233333333334444444444555555555566666666667
1234567890123456789012345678901234567890123456789012345678901234567890
 FILE: STINDX3.24LOT
// NEW TEST CASE// 3 GANTRY CRANES// 24 TRUCKS // 6 YARD CRANES//
 It contains the list of indexes in which the queue list and
 the simulation stats are stored. Use as many lines as needed
    Num.of IND_QList; Num.of IND_SStats                16   24
 GCRANES  Stage; Server; INDXQL; INDXST     1    1     1    1
          Stage; Server; INDXQL; INDXST     1    2     1    1
          Stage; Server; INDXQL; INDXST     1    3     1    1
 YTRUCKS  Stage; Server; INDXQL; INDXST     2    4     2    2
          Stage; Server; INDXQL; INDXST     2    5     2    2
          Stage; Server; INDXQL; INDXST     2    6     2    2
          Stage; Server; INDXQL; INDXST     2    7     2    2
          Stage; Server; INDXQL; INDXST     2    8     2    2
          Stage; Server; INDXQL; INDXST     2    9     2    2
          Stage; Server; INDXQL; INDXST     2   10     2    2
          Stage; Server; INDXQL; INDXST     2   11     2    2
          Stage; Server; INDXQL; INDXST     2   12     2    2
          Stage; Server; INDXQL; INDXST     2   13     2    2
          Stage; Server; INDXQL; INDXST     2   14     2    2
          Stage; Server; INDXQL; INDXST     2   15     2    2
          Stage; Server; INDXQL; INDXST     2   16     2    2
          Stage; Server; INDXQL; INDXST     2   17     2    2
          Stage; Server; INDXQL; INDXST     2   18     2    2
          Stage; Server; INDXQL; INDXST     2   19     2    2
          Stage; Server; INDXQL; INDXST     2   20     2    2
          Stage; Server; INDXQL; INDXST     2   21     2    2
          Stage; Server; INDXQL; INDXST     2   22     2    2
          Stage; Server; INDXQL; INDXST     2   23     2    2
          Stage; Server; INDXQL; INDXST     2   24     2    2
          Stage; Server; INDXQL; INDXST     2   25     2    2
          Stage; Server; INDXQL; INDXST     2   26     2    2
          Stage; Server; INDXQL; INDXST     2   27     2    2
YCRANES_3 Stage; Server; INDXQL; INDXST     3   28     3    3
          Stage; Server; INDXQL; INDXST     3   29     4    4
          Stage; Server; INDXQL; INDXST     3   30     5    5
          Stage; Server; INDXQL; INDXST     3   31     6    6
          Stage; Server; INDXQL; INDXST     3   32     7    7
          Stage; Server; INDXQL; INDXST     3   33     8    8
GATES_IN  Stage; Server; INDXQL; INDXST     7   34     9    9
          Stage; Server; INDXQL; INDXST     7   35     9    9
          Stage; Server; INDXQL; INDXST     7   36     9    9
          Stage; Server; INDXQL; INDXST     7   37     9    9
          Stage; Server; INDXQL; INDXST     7   38     9    9
          Stage; Server; INDXQL; INDXST     7   39     9    9
          Stage; Server; INDXQL; INDXST     7   40     9    9
          Stage; Server; INDXQL; INDXST     7   41     9    9
TRUCKS_IN Stage; Server; INDXQL; INDXST     8   51    99   10
YCRANES_9 Stage; Server; INDXQL; INDXST     9   28    10   11
          Stage; Server; INDXQL; INDXST     9   29    11   13
          Stage; Server; INDXQL; INDXST     9   30    12   15
          Stage; Server; INDXQL; INDXST     9   31    13   17
          Stage; Server; INDXQL; INDXST     9   32    14   19
```

```
          Stage; Server; INDXQL; INDXST     9   33   15   21
TRUCK_OUT Stage; Server; INDXQL; INDXST    10   51   99   23
GATES_OUT Stage; Server; INDXQL; INDXST    11   42   16   24
          Stage; Server; INDXQL; INDXST    11   43   16   24
          Stage; Server; INDXQL; INDXST    11   44   16   24
          Stage; Server; INDXQL; INDXST    11   45   16   24
          Stage; Server; INDXQL; INDXST    11   46   16   24
          Stage; Server; INDXQL; INDXST    11   47   16   24
          Stage; Server; INDXQL; INDXST    11   48   16   24
          Stage; Server; INDXQL; INDXST    11   49   16   24
```

2.2.13 TSTAG.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: TSTAG.24LOT
 It contains the titles to be used by PRNT2B. Each stage must
 have a title (except yard cranes, that need a title/crane)

 Gantry cranes                          : GANTRY_CRANES
 Yard trucks                            : YARD_TRUCKS
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_28
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_29
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_30
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_31
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_32
 Yard crane STAGE 3 (one title/crane)   : YARD_CRANE_33
 Yard Gates (IN)                        : YARD_GATES_IN
 Trucks (IN)                            : TRUCKS_IN
 YC STAGE 9 (two titles: order+truck)   : YC_28_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_28_TRUCKS
 YC STAGE 9 (two titles: order+truck)   : YC_29_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_29_TRUCKS
 YC STAGE 9 (two titles: order+truck)   : YC_30_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_30_TRUCKS
 YC STAGE 9 (two titles: order+truck)   : YC_31_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_31_TRUCKS
 YC STAGE 9 (two titles: order+truck)   : YC_32_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_32_TRUCKS
 YC STAGE 9 (two titles: order+truck)   : YC_33_ORDERS
 YC STAGE 9 (two titles: order+truck)   : YC_33_TRUCKS
 Trucks (OUT)                           : TRUCKS_OUT
 Yard Gates (OUT)                       : YARD_GATES_OUT
```

2.2.14 TSERV.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: TSERV.24LOT
 It contains the titles to be used by PRNT2C and E.
 Each server has only a title.

 Gantry crane #1                        : GANTRY_CRANE_1
 Gantry crane #2                        : GANTRY_CRANE_2
 Gantry crane #3                        : GANTRY_CRANE_3
 Yard trucks  #4                        : YARD_TRUCK_4
 Yard trucks  #5                        : YARD_TRUCK_5
 Yard trucks  #6                        : YARD_TRUCK_6
```

```
Yard trucks  #7                    : YARD_TRUCK_7
Yard trucks  #8                    : YARD_TRUCK_8
Yard trucks  #9                    : YARD_TRUCK_9
Yard trucks  #10                   : YARD_TRUCK_10
Yard trucks  #11                   : YARD_TRUCK_11
Yard trucks  #12                   : YARD_TRUCK_12
Yard trucks  #13                   : YARD_TRUCK_13
Yard trucks  #14                   : YARD_TRUCK_14
Yard trucks  #15                   : YARD_TRUCK_15
Yard trucks  #16                   : YARD_TRUCK_16
Yard trucks  #17                   : YARD_TRUCK_17
Yard trucks  #18                   : YARD_TRUCK_18
Yard trucks  #19                   : YARD_TRUCK_19
Yard trucks  #20                   : YARD_TRUCK_20
Yard trucks  #21                   : YARD_TRUCK_21
Yard trucks  #22                   : YARD_TRUCK_22
Yard trucks  #23                   : YARD_TRUCK_23
Yard trucks  #24                   : YARD_TRUCK_24
Yard trucks  #25                   : YARD_TRUCK_25
Yard trucks  #26                   : YARD_TRUCK_26
Yard trucks  #27                   : YARD_TRUCK_27
Yard crane # 28                    : YARD_CRANE_28
Yard crane # 29                    : YARD_CRANE_29
Yard crane # 30                    : YARD_CRANE_30
Yard crane # 31                    : YARD_CRANE_31
Yard crane # 30                    : YARD_CRANE_32
Yard crane # 31                    : YARD_CRANE_33
Yard Gates (IN) # 34               : GATES_IN_34
Yard Gates (IN) # 35               : GATES_IN_35
Yard Gates (IN) # 36               : GATES_IN_36
Yard Gates (IN) # 37               : GATES_IN_37
Yard Gates (IN) # 38               : GATES_IN_38
Yard Gates (IN) # 39               : GATES_IN_39
Yard Gates (IN) # 40               : GATES_IN_40
Yard Gates (IN) # 41               : GATES_IN_41
Yard Gates (OUT) #42               : GATES_OUT_42
Yard Gates (OUT) #43               : GATES_OUT_43
Yard Gates (OUT) #44               : GATES_OUT_44
Yard Gates (OUT) #45               : GATES_OUT_45
Yard Gates (OUT) #46               : GATES_OUT_46
Yard Gates (OUT) #47               : GATES_OUT_47
Yard Gates (OUT) #48               : GATES_OUT_48
Yard Gates (OUT) #49               : GATES_OUT_49
```

2.2.15 TQ26.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE: TQ26.24LOT
 It contains the titles to be used by PRNT14.
 Each server with a queue list has a title.

 Gantry crane #                    : GCRANE
 Yard trucks  #                    : TRUCKS
 Yard crane #                      : YC28_3
 Yard crane #                      : YC29_3
 Yard crane #                      : YC30_3
```

```
Yard crane #                          : YC31_3
Yard crane #                          : YC32_3
Yard crane #                          : YC33_3
Yard Gates (IN) #                     : GATIN
Yard crane #                          : YC28_O
Yard crane #                          : YC29_O
Yard crane #                          : YC30_O
Yard crane #                          : YC31_O
Yard crane #                          : YC32_O
Yard crane #                          : YC33_O
Yard Gates (OUT) #                    : GATOUT
```

2.2.16 BRKDWN.24LOT

```
000000000111111111122222222223333333333444444444455555555556666666667
123456789012345678901234567890123456789012345678901234567890123456789
 FILE : BRKDWN.24LOT
 It contains the breakdowns characteristics for stages 1,2 and 3
 (gantry cranes, yard trucks and yard cranes).

 GANTRY CRANES
 Mean time between failures (hours)        120.000
 Mean repair time (hours)                    0.500
 YARD TRUCKS
 Mean time between failures (hours)        100.000
 Mean repair time (hours)                    1.500
 YARD CRANES
 Mean time between failures (hours)        120.000
 Mean repair time (hours)                    0.500

 PROBABILITIES OF ABNORMAL OBSERVATIONS / STAGE
 Pr(abnormal):  GANTRY CRANE OPERATIONS      0.0408
 Pr(abnormal):    YARD TRUCK OPERATIONS      0.0000
 Pr(abnormal):    YARD CRANE OPERATIONS      0.1622
 Pr(abnormal):     YARD CRANE MOVEMENTS      0.3243
 Pr(abnormal):              Empty (0.00)     0.0000
 Pr(abnormal):              Empty (0.00)     0.0000
 Pr(abnormal):                YARD GATES     0.0000
 Pr(abnormal): MOVEMENT OF RETRIEVAL #1      0.0000
 Pr(abnormal):    YARD CRANE OPERATIONS      0.1622
 Pr(abnormal): MOVEMENT OF RETRIEVAL #2      0.0000
 Pr(abnormal):                YARD GATES     0.0000
```

2.3 PRIOR: TYPICAL OUTPUT FILES

In this section the non-discretionary output files are presented.

2.3.1 OUT.EXAM

Note: The output file presented in this section corresponds to the shortest output file generated by PRIOR (Print code = 1). The output file corresponding to a print code equal to 3 (full print out) would require twenty pages per observation.

OPERATIONAL PARAMETERS :
CREATION : RANDOM / LOT_ASSIG: P_RANDOM/ G_CRANE : B_CASE /
Y_CRANE : B_CASE / GATES IN : B_CASE / GATES OUT: B_CASE /

MAIN CHARACTERISTICS OF THE RUN:
3 GANTRY CRANES / 24 YARD TRUCKS / 6 YARD CRANES /
8 YARD GATES-IN / 8 YARD GATES-OUT / 10 LAYERS ON SHIP /

---------- SIMULATION STATISTICS ----------
---------- FOR BATCH : 1 ----------

LEVEL 1 (SHIPS) STATISTICS

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
UNLOADING	1.	32967.85	0.00	0.	0.00	0.00

LEVEL 2 (CONTAINERS) STATISTICS

---------- PRIORITY 1 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1061.35	24733.13	25794.48

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	507.	82.73	31.72	504.	15408.17	9388.83
YARD_TRUCKS	507.	46.70	18.97	98.	55.65	54.91
YARD_CRANE_28	77.	122.19	68.98	72.	713.18	384.66
YARD_CRANE_29	69.	120.13	61.49	62.	452.39	398.73
YARD_CRANE_30	94.	139.99	87.47	88.	421.27	355.82
YARD_CRANE_31	74.	129.32	74.04	68.	472.17	365.61
YARD_CRANE_32	100.	115.04	58.19	88.	463.77	395.25
YARD_CRANE_33	92.	141.96	97.96	89.	531.97	316.32
YARD_GATES_IN	644.	221.48	41.93	523.	249.43	189.40
TRUCKS_IN	590.	39.54	15.11	2.	34.50	2.04
YC_28_ORDERS	10.	134.92	62.20	11.	7315.49	6542.36
YC_28_TRUCKS	0.	0.00	0.00	11.	6122.61	7092.68
YC_29_ORDERS	16.	199.31	161.38	16.	8818.96	7415.18
YC_29_TRUCKS	0.	0.00	0.00	15.	9131.88	7502.45
YC_30_ORDERS	6.	190.87	94.80	7.	10474.51	8483.12
YC_30_TRUCKS	0.	0.00	0.00	6.	8466.18	8308.39
YC_31_ORDERS	15.	229.19	185.84	15.	7981.23	7661.91
YC_31_TRUCKS	0.	0.00	0.00	15.	7494.12	7820.50
YC_32_ORDERS	8.	279.36	215.43	9.	9480.61	4745.39
YC_32_TRUCKS	0.	0.00	0.00	8.	7666.53	6931.03
YC_33_ORDERS	11.	143.79	81.80	12.	12702.18	6306.84
YC_33_TRUCKS	0.	0.00	0.00	11.	11882.73	6201.26
TRUCKS_OUT	66.	38.54	17.35	0.	0.00	0.00
YARD_GATES_OUT	60.	503.92	179.12	0.	0.00	0.00

STAGE	# OF OBS.	BROKEN TIME MEAN	BROKEN TIME STD. DEV.	# OF OBS.	REPOSITIONING TIME MEAN	REPOSITIONING TIME STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	0.	0.00	0.00
YARD_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YARD_CRANE_28	0.	0.00	0.00	16.	191.93	81.54
YARD_CRANE_29	0.	0.00	0.00	14.	212.71	111.73
YARD_CRANE_30	0.	0.00	0.00	16.	210.69	102.86
YARD_CRANE_31	0.	0.00	0.00	13.	229.05	66.39
YARD_CRANE_32	0.	0.00	0.00	11.	155.65	65.74
YARD_CRANE_33	0.	0.00	0.00	8.	227.24	70.56
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	8.	198.01	73.30
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	10.	166.97	94.53
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	5.	150.77	61.05
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	10.	227.27	106.75
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	3.	202.79	40.10
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	6.	216.72	82.93
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		% OF TIME WAITING FOR : G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5454.
YARD TRUCKS	(YT)	29.1	0.0	70.9	0.0	0.0	0.0	0.0	333958.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	69.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7765719.
EXTERNAL TRUCKS	(ET)	0.0	0.0	81.1	18.9	0.0	0.0	0.0	690031.

---------- PRIORITY 2 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	268.83	14814.85	15083.68

STAGE	# OF OBS.	SERVICE TIME MEAN	SERVICE TIME STD. DEV.	# OF OBS.	WAITING TIME MEAN	WAITING TIME STD. DEV.
GANTRY_CRANES	493.	86.51	36.27	493.	14267.78	9183.91
YARD_TRUCKS	492.	49.19	18.80	85.	45.66	51.59
YARD_CRANE_28	82.	122.60	64.04	76.	692.70	408.92
YARD_CRANE_29	76.	150.15	82.71	73.	482.49	376.75
YARD_CRANE_30	75.	140.27	74.34	70.	430.36	402.54
YARD_CRANE_31	75.	129.79	64.52	72.	418.97	296.03
YARD_CRANE_32	96.	130.69	83.50	89.	445.09	383.07
YARD_CRANE_33	88.	127.64	68.05	83.	534.73	327.09
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00

TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	17.	17.48	3.84
YARD_TRUCKS	0.	0.00	0.00	998.	65.41	14.85
YARD_CRANE_28	0.	0.00	0.00	19.	211.63	88.90
YARD_CRANE_29	0.	0.00	0.00	16.	185.90	81.43
YARD_CRANE_30	0.	0.00	0.00	11.	244.43	121.61
YARD_CRANE_31	0.	0.00	0.00	12.	230.42	62.52
YARD_CRANE_32	0.	0.00	0.00	12.	191.28	86.77
YARD_CRANE_33	0.	0.00	0.00	11.	217.82	50.15
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	3881.
YARD TRUCKS	(YT)	29.0	0.0	71.0	0.0	0.0	0.0	0.0	326890.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7034016.
EXTERNAL TRUCKS	(ET)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.

MAIN CHARACTERISTICS OF THE RUN:
3 GANTRY CRANES / 24 YARD TRUCKS / 6 YARD CRANES /
8 YARD GATES-IN / 8 YARD GATES-OUT / 10 LAYERS ON SHIP /

---------- SIMULATION STATISTICS ----------
---------- FOR BATCH : 2 ----------

LEVEL 1 (SHIPS) STATISTICS

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
UNLOADING	1.	32065.06	0.00	0.	0.00	0.00

LEVEL 2 (CONTAINERS) STATISTICS

---------- PRIORITY 1 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1044.13	44235.40	45279.52

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	503.	84.87	38.26	501.	14419.01	9066.10
YARD_TRUCKS	503.	45.20	15.87	45.	63.37	66.33
YARD_CRANE_28	81.	143.17	95.88	69.	471.00	294.68
YARD_CRANE_29	76.	136.79	92.08	66.	422.83	339.85
YARD_CRANE_30	76.	131.92	86.04	68.	377.99	273.25
YARD_CRANE_31	91.	108.71	47.57	79.	262.21	197.10
YARD_CRANE_32	99.	133.11	74.03	88.	333.55	270.66
YARD_CRANE_33	81.	137.23	83.41	73.	472.02	328.95
YARD_GATES_IN	489.	217.85	45.50	378.	239.22	195.10
TRUCKS_IN	519.	36.47	16.38	11.	18.43	7.22
YC_28_ORDERS	137.	208.57	150.65	136.	28978.63	16481.54
YC_28_TRUCKS	0.	0.00	0.00	132.	29064.10	16698.30
YC_29_ORDERS	136.	217.87	149.72	137.	29584.05	16885.59
YC_29_TRUCKS	0.	0.00	0.00	136.	29339.41	16993.51
YC_30_ORDERS	132.	220.44	151.33	131.	27895.54	16148.51
YC_30_TRUCKS	0.	0.00	0.00	128.	27862.69	16306.32
YC_31_ORDERS	118.	239.49	170.08	119.	28514.90	15104.18
YC_31_TRUCKS	0.	0.00	0.00	118.	27714.58	16026.43
YC_32_ORDERS	125.	211.41	149.66	124.	29884.72	16532.29
YC_32_TRUCKS	0.	0.00	0.00	122.	29026.29	17576.49
YC_33_ORDERS	118.	239.35	183.61	118.	29960.03	16267.59
YC_33_TRUCKS	0.	0.00	0.00	118.	29445.35	16568.84
TRUCKS_OUT	765.	46.08	14.75	0.	0.00	0.00
YARD_GATES_OUT	763.	482.30	179.68	485.	358.03	271.12

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	0.	0.00	0.00
YARD_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YARD_CRANE_28	0.	0.00	0.00	12.	202.56	44.70
YARD_CRANE_29	0.	0.00	0.00	11.	258.14	79.20

YARD_CRANE_30	0.	0.00	0.00	6.	278.21	61.23
YARD_CRANE_31	0.	0.00	0.00	6.	245.22	41.37
YARD_CRANE_32	0.	0.00	0.00	6.	305.03	103.87
YARD_CRANE_33	0.	0.00	0.00	4.	273.58	72.81
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	99.	206.36	70.25
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	102.	200.42	84.58
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	94.	215.99	73.28
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	89.	206.07	78.31
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	94.	216.54	78.40
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	92.	201.78	86.33
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1483.
YARD TRUCKS	(YT)	98.1	0.0	1.9	0.0	0.0	0.0	0.0	8913449.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	203.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7223922.
EXTERNAL TRUCKS	(ET)	0.0	0.0	98.8	0.4	0.8	0.0	0.0	21943196.

---------- PRIORITY 2 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1049.16	15636.55	16685.72

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	497.	86.36	35.83	496.	14790.79	8397.45
YARD_TRUCKS	497.	45.54	16.74	44.	46.80	61.56
YARD_CRANE_28	80.	127.14	76.55	72.	455.94	292.14
YARD_CRANE_29	76.	128.31	69.03	67.	342.93	297.27
YARD_CRANE_30	74.	136.73	80.73	66.	408.28	316.36
YARD_CRANE_31	97.	128.74	84.18	84.	329.90	238.65
YARD_CRANE_32	86.	129.44	74.39	80.	276.95	229.74
YARD_CRANE_33	84.	128.97	58.25	76.	383.60	337.75
YARD_GATES_IN	1514.	221.40	43.22	0.	0.00	0.00
TRUCKS_IN	1514.	40.19	16.03	498.	102.08	68.07
YC_28_ORDERS	257.	141.29	115.13	301.	199.52	216.47
YC_28_TRUCKS	0.	0.00	0.00	160.	215.22	238.75
YC_29_ORDERS	257.	141.75	110.23	297.	202.82	203.40
YC_29_TRUCKS	0.	0.00	0.00	160.	231.84	203.69
YC_30_ORDERS	270.	145.10	114.21	313.	174.30	168.39
YC_30_TRUCKS	0.	0.00	0.00	191.	193.41	161.41

YC_31_ORDERS	281.	157.39	119.80	323.	205.86	206.94
YC_31_TRUCKS	0.	0.00	0.00	196.	242.51	225.29
YC_32_ORDERS	283.	155.39	132.63	312.	227.34	199.82
YC_32_TRUCKS	0.	0.00	0.00	203.	246.03	219.23
YC_33_ORDERS	166.	142.45	113.32	218.	182.91	206.28
YC_33_TRUCKS	0.	0.00	0.00	106.	233.37	201.00
TRUCKS_OUT	1514.	43.37	15.43	0.	0.00	0.00
YARD_GATES_OUT	1514.	482.54	174.94	1.	106.30	0.00

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	17.	24.68	18.78
YARD_TRUCKS	0.	0.00	0.00	1001.	68.33	13.45
YARD_CRANE_28	0.	0.00	0.00	7.	232.38	66.84
YARD_CRANE_29	0.	0.00	0.00	6.	190.95	78.37
YARD_CRANE_30	0.	0.00	0.00	9.	194.76	57.56
YARD_CRANE_31	0.	0.00	0.00	6.	179.27	59.18
YARD_CRANE_32	0.	0.00	0.00	3.	271.08	120.90
YARD_CRANE_33	0.	0.00	0.00	4.	304.80	103.05
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	199.	205.05	86.82
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	197.	210.64	88.64
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	205.	199.13	81.49
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	222.	220.44	91.79
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	221.	214.52	86.13
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	128.	210.74	88.19
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1254.
YARD TRUCKS	(YT)	97.0	0.0	3.0	0.0	0.0	0.0	0.0	5457383.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	50838.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7336226.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	230791.

MAIN CHARACTERISTICS OF THE RUN:

3 GANTRY CRANES / 24 YARD TRUCKS / 6 YARD CRANES /
8 YARD GATES-IN / 8 YARD GATES-OUT / 10 LAYERS ON SHIP /

---------- SIMULATION STATISTICS ----------
---------- FOR BATCH : 3 ----------

LEVEL 1 (SHIPS) STATISTICS

STAGE	# OF OBS.	SERVICE TIME MEAN	SERVICE TIME STD. DEV.	# OF OBS.	WAITING TIME MEAN	WAITING TIME STD. DEV.
UNLOADING	1.	32092.50	0.00	0.	0.00	0.00

LEVEL 2 (CONTAINERS) STATISTICS

---------- PRIORITY 1 ----------

	SERVICE TIME	WAITING TIME	TOTAL
TOTAL	1045.86	31909.80	32955.66

STAGE	# OF OBS.	SERVICE TIME MEAN	SERVICE TIME STD. DEV.	# OF OBS.	WAITING TIME MEAN	WAITING TIME STD. DEV.
GANTRY_CRANES	498.	83.79	36.33	498.	14764.71	8881.52
YARD_TRUCKS	497.	43.43	19.61	63.	49.38	46.29
YARD_CRANE_28	84.	113.44	65.31	79.	587.80	290.97
YARD_CRANE_29	73.	145.70	89.84	64.	598.67	357.84
YARD_CRANE_30	79.	135.61	79.37	71.	560.80	379.92
YARD_CRANE_31	84.	122.90	76.46	73.	493.71	301.44
YARD_CRANE_32	82.	124.06	67.51	75.	480.98	312.08
YARD_CRANE_33	94.	128.16	77.82	88.	420.02	277.63
YARD_GATES_IN	483.	221.37	41.90	320.	140.77	123.14
TRUCKS_IN	474.	38.80	15.26	0.	0.00	0.00
YC_28_ORDERS	86.	223.00	141.72	86.	17603.97	8604.98
YC_28_TRUCKS	0.	0.00	0.00	86.	17080.65	9182.73
YC_29_ORDERS	75.	262.29	161.93	75.	17085.25	8912.63
YC_29_TRUCKS	0.	0.00	0.00	75.	16077.73	9210.02
YC_30_ORDERS	81.	223.62	136.04	82.	17254.41	7831.16
YC_30_TRUCKS	0.	0.00	0.00	81.	16944.59	8252.16
YC_31_ORDERS	82.	235.99	152.22	81.	15382.19	8078.78
YC_31_TRUCKS	0.	0.00	0.00	81.	14984.29	8478.79
YC_32_ORDERS	77.	241.04	174.62	78.	15581.66	8757.41
YC_32_TRUCKS	0.	0.00	0.00	77.	15316.41	9105.48
YC_33_ORDERS	77.	224.88	148.76	76.	16416.15	7918.95
YC_33_TRUCKS	0.	0.00	0.00	77.	16183.84	7976.13
TRUCKS_OUT	478.	43.82	13.41	0.	0.00	0.00
YARD_GATES_OUT	482.	486.79	171.61	330.	321.41	234.52

STAGE	# OF OBS.	BROKEN TIME MEAN	BROKEN TIME STD. DEV.	# OF OBS.	REPOSITIONING TIME MEAN	REPOSITIONING TIME STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	0.	0.00	0.00
YARD_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YARD_CRANE_28	0.	0.00	0.00	19.	258.10	76.87
YARD_CRANE_29	0.	0.00	0.00	19.	214.53	47.69
YARD_CRANE_30	0.	0.00	0.00	16.	268.56	73.57
YARD_CRANE_31	0.	0.00	0.00	10.	228.36	64.98
YARD_CRANE_32	0.	0.00	0.00	4.	275.75	61.67
YARD_CRANE_33	0.	0.00	0.00	9.	212.18	74.27
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	57.	202.79	88.92

YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	51.	221.54	66.02
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	60.	211.92	76.69
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	58.	195.84	78.81
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	54.	201.43	77.41
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	56.	192.18	79.04
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	3111.
YARD TRUCKS	(YT)	95.3	0.0	4.7	0.0	0.0	0.0	0.0	4922691.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7352817.
EXTERNAL TRUCKS	(ET)	0.0	0.0	98.1	0.6	1.4	0.0	0.0	7837639.

---------- PRIORITY 2 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1058.33	15202.96	16261.28

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	502.	86.53	33.10	499.	14407.19	8867.22
YARD_TRUCKS	503.	43.06	19.01	57.	58.67	64.86
YARD_CRANE_28	83.	126.06	71.64	80.	611.48	359.63
YARD_CRANE_29	69.	130.90	75.41	59.	526.53	371.04
YARD_CRANE_30	66.	128.02	89.94	57.	456.13	360.48
YARD_CRANE_31	67.	131.48	66.07	57.	482.79	349.21
YARD_CRANE_32	122.	129.53	73.26	105.	391.88	293.17
YARD_CRANE_33	92.	136.08	82.87	85.	407.42	310.94
YARD_GATES_IN	497.	220.12	42.13	0.	0.00	0.00
TRUCKS_IN	497.	36.08	16.06	209.	101.25	71.81
YC_28_ORDERS	81.	158.26	146.87	58.	211.34	77.31
YC_28_TRUCKS	0.	0.00	0.00	48.	161.61	143.51
YC_29_ORDERS	98.	158.73	147.14	79.	213.54	96.30
YC_29_TRUCKS	0.	0.00	0.00	67.	178.54	164.20
YC_30_ORDERS	70.	150.06	102.38	50.	202.63	87.92
YC_30_TRUCKS	0.	0.00	0.00	38.	114.96	88.95
YC_31_ORDERS	97.	146.55	112.98	71.	238.63	115.41
YC_31_TRUCKS	0.	0.00	0.00	60.	192.32	135.86
YC_32_ORDERS	102.	158.43	138.67	77.	206.58	93.95
YC_32_TRUCKS	0.	0.00	0.00	59.	166.17	156.09

YC_33_ORDERS	49.	144.32	123.84	24.	200.11	45.72
YC_33_TRUCKS	0.	0.00	0.00	16.	102.25	87.38
TRUCKS_OUT	497.	44.96	12.20	0.	0.00	0.00
YARD_GATES_OUT	497.	497.15	180.94	0.	0.00	0.00

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	17.	17.59	4.30
YARD_TRUCKS	0.	0.00	0.00	995.	62.32	15.15
YARD_CRANE_28	0.	0.00	0.00	12.	233.91	65.07
YARD_CRANE_29	0.	0.00	0.00	11.	257.42	85.41
YARD_CRANE_30	0.	0.00	0.00	12.	275.79	99.32
YARD_CRANE_31	0.	0.00	0.00	9.	233.83	80.61
YARD_CRANE_32	0.	0.00	0.00	4.	289.13	104.90
YARD_CRANE_33	0.	0.00	0.00	13.	209.20	46.86
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	58.	205.61	73.74
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	75.	192.49	71.77
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	50.	181.05	66.48
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	71.	216.73	81.28
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	77.	200.83	86.00
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	23.	204.08	42.44
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	2721.
YARD TRUCKS	(YT)	97.8	0.0	2.2	0.0	0.0	0.0	0.0	9496754.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	21162.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7189180.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	47067.

MAIN CHARACTERISTICS OF THE RUN:
3 GANTRY CRANES / 24 YARD TRUCKS / 6 YARD CRANES /
8 YARD GATES-IN / 8 YARD GATES-OUT / 10 LAYERS ON SHIP /

---------- SIMULATION STATISTICS ----------
---------- FOR BATCH : 4 ----------

LEVEL 1 (SHIPS) STATISTICS

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
UNLOADING	1.	40138.50	0.00	0.	0.00	0.00

LEVEL 2 (CONTAINERS) STATISTICS

---------- PRIORITY 1 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1050.02	35105.80	36155.81

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	526.	84.06	37.05	524.	17984.78	10717.96
YARD_TRUCKS	527.	41.82	17.70	108.	63.74	64.93
YARD_CRANE_28	94.	121.21	59.17	85.	697.00	591.70
YARD_CRANE_29	80.	130.41	74.05	72.	1085.34	2202.14
YARD_CRANE_30	71.	138.61	77.02	54.	421.91	396.81
YARD_CRANE_31	94.	133.08	81.82	74.	348.96	361.72
YARD_CRANE_32	94.	126.08	70.38	77.	453.95	349.27
YARD_CRANE_33	95.	128.41	80.44	83.	477.95	543.82
YARD_GATES_IN	693.	219.92	42.68	640.	306.73	199.65
TRUCKS_IN	689.	39.81	14.75	6.	83.83	105.56
YC_28_ORDERS	93.	261.26	169.27	93.	16818.45	9717.25
YC_28_TRUCKS	0.	0.00	0.00	93.	16312.01	10152.65
YC_29_ORDERS	112.	207.27	146.76	112.	16923.41	9693.82
YC_29_TRUCKS	0.	0.00	0.00	112.	16036.92	10437.65
YC_30_ORDERS	94.	234.33	161.92	94.	16424.69	10059.88
YC_30_TRUCKS	0.	0.00	0.00	93.	16005.79	10403.46
YC_31_ORDERS	92.	244.37	165.86	91.	15091.88	8598.79
YC_31_TRUCKS	0.	0.00	0.00	89.	13941.35	9694.62
YC_32_ORDERS	92.	228.46	155.27	91.	17256.93	7704.11
YC_32_TRUCKS	0.	0.00	0.00	92.	16401.22	8378.12
YC_33_ORDERS	97.	270.13	179.30	98.	18281.33	7071.62
YC_33_TRUCKS	0.	0.00	0.00	98.	16730.29	8914.66
TRUCKS_OUT	581.	50.50	14.94	0.	0.00	0.00
YARD_GATES_OUT	578.	484.70	167.07	246.	152.19	107.52

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	0.	0.00	0.00
YARD_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YARD_CRANE_28	0.	0.00	0.00	13.	288.49	67.66
YARD_CRANE_29	0.	0.00	0.00	11.	265.89	67.84
YARD_CRANE_30	0.	0.00	0.00	13.	290.35	85.31
YARD_CRANE_31	0.	0.00	0.00	5.	272.13	51.27
YARD_CRANE_32	0.	0.00	0.00	6.	233.85	64.70
YARD_CRANE_33	0.	0.00	0.00	8.	243.20	57.89
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	65.	212.79	93.94
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	71.	223.17	84.26
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	68.	217.40	76.05
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00

YC_31_ORDERS	0.	0.00	0.00	61.	207.57	86.70
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	65.	211.23	75.21
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	69.	182.05	67.21
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5783.
YARD TRUCKS	(YT)	96.9	0.0	3.1	0.0	0.0	0.0	0.0	8466303.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	503.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	9424008.
EXTERNAL TRUCKS	(ET)	0.0	0.0	97.5	2.1	0.4	0.0	0.0	9424699.

---------- PRIORITY 2 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1054.84	20280.45	21335.29

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	474.	83.73	37.01	473.	19424.50	11086.65
YARD_TRUCKS	473.	42.34	16.37	93.	65.22	64.78
YARD_CRANE_28	86.	138.50	81.92	78.	576.69	520.89
YARD_CRANE_29	66.	134.74	81.18	58.	852.65	1504.46
YARD_CRANE_30	77.	125.79	72.13	62.	425.71	434.74
YARD_CRANE_31	70.	135.34	76.82	52.	579.62	505.23
YARD_CRANE_32	99.	129.00	73.40	83.	390.30	386.01
YARD_CRANE_33	78.	129.43	72.23	62.	304.94	309.57
YARD_GATES_IN	502.	219.63	42.99	0.	0.00	0.00
TRUCKS_IN	502.	38.89	14.63	210.	97.55	68.05
YC_28_ORDERS	104.	153.74	108.83	84.	222.26	138.39
YC_28_TRUCKS	0.	0.00	0.00	63.	181.87	184.73
YC_29_ORDERS	94.	169.01	127.43	79.	229.63	125.23
YC_29_TRUCKS	0.	0.00	0.00	57.	188.40	179.90
YC_30_ORDERS	100.	146.66	118.10	79.	221.24	104.27
YC_30_TRUCKS	0.	0.00	0.00	59.	167.40	145.43
YC_31_ORDERS	105.	159.93	124.83	78.	210.01	113.92
YC_31_TRUCKS	0.	0.00	0.00	58.	199.38	164.32
YC_32_ORDERS	46.	156.99	124.47	32.	182.55	84.10
YC_32_TRUCKS	0.	0.00	0.00	27.	173.43	113.88
YC_33_ORDERS	53.	142.35	125.90	40.	189.06	93.45
YC_33_TRUCKS	0.	0.00	0.00	28.	162.89	154.51
TRUCKS_OUT	502.	50.42	15.21	0.	0.00	0.00
YARD_GATES_OUT	502.	487.84	176.73	0.	0.00	0.00

STAGE	BROKEN TIME # OF OBS.	BROKEN TIME MEAN	BROKEN TIME STD. DEV.	REPOSITIONING TIME # OF OBS.	REPOSITIONING TIME MEAN	REPOSITIONING TIME STD. DEV.
GANTRY_CRANES	2.	4673.38	2375.63	17.	20.33	5.02
YARD_TRUCKS	0.	0.00	0.00	1004.	63.55	14.72
YARD_CRANE_28	0.	0.00	0.00	12.	265.84	106.59
YARD_CRANE_29	0.	0.00	0.00	17.	262.17	81.30
YARD_CRANE_30	1.	1726.25	0.00	10.	239.41	82.15
YARD_CRANE_31	0.	0.00	0.00	11.	262.14	66.95
YARD_CRANE_32	0.	0.00	0.00	6.	257.13	55.87
YARD_CRANE_33	0.	0.00	0.00	5.	258.73	45.94
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	81.	197.06	80.38
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	78.	209.57	91.28
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	77.	208.23	77.06
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	74.	189.91	76.98
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	32.	180.54	85.38
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	38.	184.10	86.52
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		% OF TIME WAITING FOR : G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5269.
YARD TRUCKS	(YT)	96.7	0.0	3.3	0.0	0.0	0.0	0.0	6126829.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	20485.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	9187779.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	52881.

MAIN CHARACTERISTICS OF THE RUN:
3 GANTRY CRANES / 24 YARD TRUCKS / 6 YARD CRANES /
8 YARD GATES-IN / 8 YARD GATES-OUT / 10 LAYERS ON SHIP /

---------- SIMULATION STATISTICS ----------
---------- FOR BATCH : 5 ----------

LEVEL 1 (SHIPS) STATISTICS

STAGE	SERVICE TIME # OF OBS.	SERVICE TIME MEAN	SERVICE TIME STD. DEV.	WAITING TIME # OF OBS.	WAITING TIME MEAN	WAITING TIME STD. DEV.
UNLOADING	1.	32311.00	0.00	0.	0.00	0.00

LEVEL 2 (CONTAINERS) STATISTICS

---------- PRIORITY 1 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1049.29	38509.48	39558.78

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	505.	85.11	35.89	503.	14909.62	8866.76
YARD_TRUCKS	504.	42.86	17.91	48.	60.22	77.07
YARD_CRANE_28	99.	124.67	66.79	94.	521.40	322.43
YARD_CRANE_29	76.	120.85	57.36	67.	480.33	331.26
YARD_CRANE_30	77.	147.51	76.06	74.	306.81	233.68
YARD_CRANE_31	90.	127.86	87.88	79.	369.81	309.37
YARD_CRANE_32	93.	122.57	73.53	86.	436.08	278.67
YARD_CRANE_33	69.	152.63	90.91	64.	442.33	397.28
YARD_GATES_IN	368.	218.53	43.36	293.	185.46	116.67
TRUCKS_IN	371.	39.32	15.26	1.	5.25	0.00
YC_28_ORDERS	76.	255.54	173.11	77.	24082.23	9063.77
YC_28_TRUCKS	0.	0.00	0.00	77.	23163.45	10003.38
YC_29_ORDERS	78.	249.33	172.48	77.	23201.36	9753.45
YC_29_TRUCKS	0.	0.00	0.00	77.	22947.77	9736.41
YC_30_ORDERS	75.	239.21	148.46	74.	22727.48	9063.63
YC_30_TRUCKS	0.	0.00	0.00	74.	22187.19	9562.53
YC_31_ORDERS	74.	267.20	190.44	74.	24989.51	8363.08
YC_31_TRUCKS	0.	0.00	0.00	74.	24022.98	8987.53
YC_32_ORDERS	67.	261.46	180.28	68.	24390.34	9283.79
YC_32_TRUCKS	0.	0.00	0.00	66.	23433.09	9375.68
YC_33_ORDERS	79.	229.94	144.31	78.	22405.04	9998.17
YC_33_TRUCKS	0.	0.00	0.00	78.	21190.83	11072.21
TRUCKS_OUT	449.	51.53	13.52	0.	0.00	0.00
YARD_GATES_OUT	450.	480.35	169.54	224.	118.45	91.05

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	0.	0.00	0.00	0.	0.00	0.00
YARD_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YARD_CRANE_28	0.	0.00	0.00	12.	197.73	100.12
YARD_CRANE_29	0.	0.00	0.00	13.	211.40	88.95
YARD_CRANE_30	0.	0.00	0.00	7.	258.04	120.35
YARD_CRANE_31	0.	0.00	0.00	12.	232.23	85.02
YARD_CRANE_32	0.	0.00	0.00	14.	196.82	99.37
YARD_CRANE_33	0.	0.00	0.00	3.	241.92	9.07
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	55.	187.83	75.61
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	56.	207.57	72.89
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	51.	223.95	78.28
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	47.	216.76	94.84
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	47.	231.25	98.53
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	55.	216.16	80.28

YC_33_TRUCKS		0.	0.00	0.00	0.	0.00	0.00	
TRUCKS_OUT		0.	0.00	0.00	0.	0.00	0.00	
YARD_GATES_OUT		0.	0.00	0.00	0.	0.00	0.00	

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.01	00.0	0.0	0.0	0.0	0.0	0.0	2131.
YARD TRUCKS	(YT)	97.7	0.0	2.3	0.0	0.0	0.0	0.0	8809135.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.01	00.0	5.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(G0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7499527.
EXTERNAL TRUCKS	(ET)	0.0	0.0	99.2	0.5	0.3	0.0	0.0	10250459.

---------- PRIORITY 2 ----------

	-SERVICE TIME-	-WAITING TIME-	- TOTAL -
TOTAL	1069.11	16015.99	17085.11

	---- SERVICE TIME ----			---- WAITING TIME ----		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	495.	87.72	37.41	494.	15216.40	8838.74
YARD_TRUCKS	496.	43.71	17.32	43.	53.41	52.71
YARD_CRANE_28	87.	134.05	71.45	82.	513.84	355.36
YARD_CRANE_29	79.	137.13	90.81	69.	460.82	350.55
YARD_CRANE_30	86.	141.97	81.37	74.	391.83	237.70
YARD_CRANE_31	73.	124.59	72.75	67.	444.23	339.49
YARD_CRANE_32	79.	138.54	80.99	68.	433.77	253.14
YARD_CRANE_33	92.	130.49	67.93	87.	462.52	383.03
YARD_GATES_IN	474.	222.02	42.53	0.	0.00	0.00
TRUCKS_IN	474.	39.46	13.37	196.	108.16	75.35
YC_28_ORDERS	73.	169.01	104.18	49.	230.76	100.60
YC_28_TRUCKS	0.	0.00	0.00	41.	156.17	132.62
YC_29_ORDERS	111.	154.96	105.05	91.	236.43	125.88
YC_29_TRUCKS	0.	0.00	0.00	73.	192.34	152.32
YC_30_ORDERS	94.	161.47	110.87	72.	222.62	93.11
YC_30_TRUCKS	0.	0.00	0.00	60.	189.15	147.51
YC_31_ORDERS	89.	140.38	116.24	64.	232.81	95.50
YC_31_TRUCKS	0.	0.00	0.00	45.	179.38	128.41
YC_32_ORDERS	19.	192.75	125.16	0.	0.00	0.00
YC_32_TRUCKS	0.	0.00	0.00	5.	135.63	87.45
YC_33_ORDERS	88.	158.25	116.72	70.	223.80	103.98
YC_33_TRUCKS	0.	0.00	0.00	54.	202.46	135.95
TRUCKS_OUT	474.	49.07	14.32	0.	0.00	0.00
YARD_GATES_OUT	474.	492.56	179.14	0.	0.00	0.00

	---- BROKEN TIME ----			- REPOSITIONING TIME -		
STAGE	# OF OBS.	MEAN	STD. DEV.	# OF OBS.	MEAN	STD. DEV.
GANTRY_CRANES	1.	940.00	0.00	17.	34.04	32.73
YARD_TRUCKS	0.	0.00	0.00	1000.	62.56	15.26
YARD_CRANE_28	0.	0.00	0.00	11.	218.50	71.23
YARD_CRANE_29	0.	0.00	0.00	11.	210.84	95.80
YARD_CRANE_30	0.	0.00	0.00	8.	183.25	72.46

YARD_CRANE_31	1.	825.75	0.00	12.	219.48	91.80
YARD_CRANE_32	0.	0.00	0.00	11.	172.20	67.68
YARD_CRANE_33	1.	2203.25	0.00	6.	265.08	78.81
YARD_GATES_IN	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_IN	0.	0.00	0.00	0.	0.00	0.00
YC_28_ORDERS	0.	0.00	0.00	48.	223.57	88.82
YC_28_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_29_ORDERS	0.	0.00	0.00	87.	207.55	79.40
YC_29_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_30_ORDERS	0.	0.00	0.00	70.	213.60	73.44
YC_30_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_31_ORDERS	0.	0.00	0.00	60.	222.37	82.39
YC_31_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_32_ORDERS	0.	0.00	0.00	0.	0.00	0.00
YC_32_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
YC_33_ORDERS	0.	0.00	0.00	68.	216.62	89.60
YC_33_TRUCKS	0.	0.00	0.00	0.	0.00	0.00
TRUCKS_OUT	0.	0.00	0.00	0.	0.00	0.00
YARD_GATES_OUT	0.	0.00	0.00	0.	0.00	0.00

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1705.
YARD TRUCKS	(YT)	96.2	0.0	3.8	0.0	0.0	0.0	0.0	5413278.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	21200.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(G0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7516887.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	51476.

2.3.2 OUT_1.EXAM

OUT_1.EXAM summarizes the performance indicators corresponding to high priority containers.

```
OPERATIONAL PARAMETERS :
CREATION : RANDOM  / LOT_ASSIG: P_RANDOM/ G_CRANE  : B_CASE  /
Y_CRANE  : B_CASE  / GATES IN : B_CASE  / GATES OUT: B_CASE  /
PRIORITY : 1
     UNLOADING STAGE Time :  REITRIEVAL STAGE.Time :    TOTAL TIME spent:        SLACK TIME data:
BATCH SERVICE WAITING  TOTAL  SERVICE WAITING  TOTAL  SERVICE WAITING  TOTAL   MEAN  STD.DEV. N.OBS

   1    258.  15971.  16229.    803.   8762.   9566.   1061.  24733.  25794.  11354.  10107.    366.
   2    261.  14868.  15129.    783.  29368.  30151.   1044.  44235.  45280.  13668.  10428.    490.
   3    255.  15333.  15588.    791.  16576.  17367.   1046.  31910.  32956.  14019.   9990.    478.
   4    255.  18634.  18889.    795.  16472.  17267.   1050.  35106.  36156.  15044.  69304.    692.
   5    260.  15399.  15658.    790.  23111.  23901.   1049.  38509.  39559.  11576.   9455.    368.
```

2.3.3 OUT_2.EXAM

OUT_2.EXAM summarizes the performance indicators corresponding to low priority containers.

```
OPERATIONAL PARAMETERS :
CREATION : RANDOM  / LOT_ASSIG: P_RANDOM/ G_CRANE  : B_CASE  /
Y_CRANE  : B_CASE  / GATES IN : B_CASE  / GATES OUT: B_CASE  /
PRIORITY : 2
     UNLOADING STAGE Time :  REITRIEVAL STAGE.Time :    TOTAL TIME spent:        SLACK TIME data:
BATCH SERVICE WAITING  TOTAL  SERVICE WAITING  TOTAL  SERVICE WAITING  TOTAL   MEAN  STD.DEV. N.OBS

   1    269.  14815.  15084.      0.      0.      0.    269.  14815.  15084.      0.      0.      0.
   2    262.  15201.  15463.    787.    435.   1223.   1049.  15637.  16686. 372503. 125441.    493.
   3    260.  14938.  15198.    798.    265.   1063.   1058.  15203.  16261. 376746. 124730.    497.
   4    258.  20002.  20260.    797.    279.   1075.   1055.  20280.  21335. 369181. 125556.    502.
   5    266.  15723.  15989.    803.    293.   1096.   1069.  16016.  17085. 361121. 122576.    474.
```

2.3.4 ECON.EXAM

ECON.EXAM containes the data that will be used by ECON to produce the economic indicators of performance.

```
INPUT FILE FOR ECON
OPERATIONAL PARAMETERS :
CREATION : RANDOM  / LOT_ASSIG: P_RANDOM/ G_CRANE  : B_CASE  /
Y_CRANE  : B_CASE  / GATES IN : B_CASE  / GATES OUT: B_CASE  /

MAIN CHARACTERISTICS OF THE RUN:
 3  GANTRY CRANES  / 24  YARD TRUCKS    /  6   YARD CRANES   /
 8  YARD GATES-IN  /  8 YARD GATES-OUT  / 10 LAYERS ON SHIP  /

PORT OUTPUT. BATCH:  1  Priority 1
BEGINNING OF SERVICE:         0.       END OF SERVICE:    32968.
TOTAL  SERVICE  TIME:    32968. TOTAL  WAITING  TIME:         0.
SERVER: G_CRAN Y_TRCK YC_S#3 GATE_I TRK_IN YC_S#9 TRK_OU GATE_O
OUTPUT:   507.   507.   506.   644.   590.    66.    66.    60.
```

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.012	46.569	0.136	0.000	7.013	32968.
GANTRY_CRANE_2	0.015	43.964	0.158	0.000	5.199	32968.
GANTRY_CRANE_3	12.636	36.660	0.103	0.000	4.335	32968.
YARD_TRUCK_4	8.821	2.099	3.261	0.000	28.919	32968.
YARD_TRUCK_5	13.841	3.048	4.489	0.000	30.263	32968.
YARD_TRUCK_6	16.358	4.265	5.624	0.000	34.148	32968.
YARD_TRUCK_7	16.240	3.412	4.632	0.000	29.240	32968.
YARD_TRUCK_8	11.044	2.372	3.701	0.000	22.037	32968.
YARD_TRUCK_9	15.005	2.951	4.307	0.000	22.419	32968.
YARD_TRUCK_10	6.321	1.978	2.885	0.000	24.575	32968.
YARD_TRUCK_11	22.167	3.919	5.630	0.000	47.325	32968.
YARD_TRUCK_12	12.139	3.249	4.180	0.000	25.100	32968.
YARD_TRUCK_13	14.375	3.112	3.940	0.000	36.663	32968.
YARD_TRUCK_14	5.818	2.223	2.745	0.000	27.360	32968.
YARD_TRUCK_15	9.321	2.545	3.767	0.000	27.208	32968.
YARD_TRUCK_16	14.614	3.767	5.681	0.000	35.665	32968.
YARD_TRUCK_17	8.323	3.018	4.186	0.000	36.168	32968.
YARD_TRUCK_18	9.618	3.012	4.195	0.000	31.512	32968.
YARD_TRUCK_19	17.459	3.446	4.447	0.000	32.425	32968.
YARD_TRUCK_20	11.854	3.397	4.668	0.000	33.511	32968.
YARD_TRUCK_21	11.029	4.043	5.014	0.000	42.004	32968.
YARD_TRUCK_22	13.932	3.373	4.268	0.000	36.302	32968.
YARD_TRUCK_23	11.077	2.457	3.679	0.000	22.294	32968.
YARD_TRUCK_24	13.904	3.003	4.240	0.000	23.247	32968.
YARD_TRUCK_25	16.853	2.445	3.418	0.000	24.833	32968.
YARD_TRUCK_26	17.317	2.754	3.946	0.000	27.785	32968.
YARD_TRUCK_27	12.036	1.893	2.930	0.000	19.100	32968.
YARD_CRANE_28	2.769	32.747	14.120	0.000	0.000	32968.
YARD_CRANE_29	2.924	34.934	14.736	0.000	0.000	32968.
YARD_CRANE_30	2.099	44.049	12.515	0.000	0.000	32968.
YARD_CRANE_31	3.370	39.456	16.110	0.000	0.000	32968.
YARD_CRANE_32	2.833	41.965	7.040	0.000	0.000	32968.
YARD_CRANE_33	2.399	44.913	9.461	0.000	0.000	32968.
GATES_IN_34	43.112	56.888	0.000	0.000	0.000	32968.
GATES_IN_35	43.849	56.151	0.000	0.000	0.000	32968.
GATES_IN_36	43.266	56.734	0.000	0.000	0.000	32968.
GATES_IN_37	44.325	55.675	0.000	0.000	0.000	32968.
GATES_IN_38	44.743	55.257	0.000	0.000	0.000	32968.
GATES_IN_39	47.959	52.041	0.000	0.000	0.000	32968.
GATES_IN_40	49.533	50.467	0.000	0.000	0.000	32968.
GATES_IN_41	48.477	51.523	0.000	0.000	0.000	32968.
GATES_OUT_42	67.851	32.149	0.000	0.000	0.000	32968.
GATES_OUT_43	75.243	24.757	0.000	0.000	0.000	32968.
GATES_OUT_44	81.464	18.536	0.000	0.000	0.000	32968.
GATES_OUT_45	87.731	12.269	0.000	0.000	0.000	32968.
GATES_OUT_46	93.196	6.804	0.000	0.000	0.000	32968.
GATES_OUT_47	98.247	1.753	0.000	0.000	0.000	32968.
GATES_OUT_48	100.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_49	100.000	0.000	0.000	0.000	0.000	32968.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5454.
YARD TRUCKS	(YT)	29.1	0.0	70.9	0.0	0.0	0.0	0.0	333958.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	69.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7765719.
EXTERNAL TRUCKS	(ET)	0.0	0.0	81.1	18.9	0.0	0.0	0.0	690031.

PORT OUTPUT. BATCH: 1 Priority 2
BEGINNING OF SERVICE: 0. END OF SERVICE: 32968.
TOTAL SERVICE TIME: 32968. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	493.	492.	492.	0.	0.	0.	0.	0.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.000	43.657	0.149	0.000	2.463	32968.
GANTRY_CRANE_2	1.526	44.931	0.161	0.000	4.046	32968.
GANTRY_CRANE_3	0.003	40.779	0.197	0.000	5.287	32968.
YARD_TRUCK_4	18.024	3.240	4.289	0.000	31.349	32968.
YARD_TRUCK_5	12.154	2.766	4.289	0.000	29.149	32968.
YARD_TRUCK_6	10.668	2.915	4.016	0.000	22.006	32968.
YARD_TRUCK_7	11.080	2.387	3.503	0.000	29.504	32968.
YARD_TRUCK_8	15.470	3.176	4.395	0.000	37.806	32968.
YARD_TRUCK_9	7.756	2.976	3.737	0.000	40.849	32968.
YARD_TRUCK_10	21.136	3.643	4.984	0.000	34.479	32968.
YARD_TRUCK_11	7.337	1.714	2.502	0.000	9.406	32968.
YARD_TRUCK_12	14.626	3.864	5.326	0.000	31.515	32968.
YARD_TRUCK_13	11.887	3.124	4.107	0.000	22.792	32968.
YARD_TRUCK_14	19.643	3.379	4.880	0.000	33.951	32968.
YARD_TRUCK_15	17.623	4.401	5.666	0.000	29.468	32968.
YARD_TRUCK_16	10.586	2.663	2.988	0.000	24.035	32968.
YARD_TRUCK_17	16.895	2.569	3.746	0.000	25.094	32968.
YARD_TRUCK_18	16.534	3.628	4.462	0.000	27.038	32968.
YARD_TRUCK_19	6.382	2.266	3.176	0.000	30.399	32968.
YARD_TRUCK_20	15.133	2.897	3.479	0.000	25.061	32968.
YARD_TRUCK_21	14.205	2.017	3.067	0.000	18.621	32968.
YARD_TRUCK_22	11.918	2.742	3.531	0.000	23.935	32968.
YARD_TRUCK_23	14.581	3.922	4.887	0.000	37.103	32968.
YARD_TRUCK_24	12.069	3.688	4.905	0.000	34.943	32968.
YARD_TRUCK_25	12.312	3.382	4.201	0.000	32.556	32968.
YARD_TRUCK_26	10.016	2.496	3.603	0.000	32.083	32968.
YARD_TRUCK_27	14.077	3.567	4.441	0.000	41.956	32968.
YARD_CRANE_28	7.674	30.505	12.185	0.000	0.000	32968.
YARD_CRANE_29	3.782	34.600	9.024	0.000	0.000	32968.
YARD_CRANE_30	1.274	31.901	8.162	0.000	0.000	32968.
YARD_CRANE_31	3.152	29.523	8.390	0.000	0.000	32968.
YARD_CRANE_32	3.139	38.061	6.961	0.000	0.000	32968.
YARD_CRANE_33	1.887	34.066	7.274	0.000	0.000	32968.
GATES_IN_34	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_35	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_36	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_37	0.000	0.000	0.000	0.000	0.000	32968.

GATES_IN_38	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_39	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_40	0.000	0.000	0.000	0.000	0.000	32968.
GATES_IN_41	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_42	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_43	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_44	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_45	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_46	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_47	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_48	0.000	0.000	0.000	0.000	0.000	32968.
GATES_OUT_49	0.000	0.000	0.000	0.000	0.000	32968.

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	3881.
YARD TRUCKS	(YT)	29.0	0.0	71.0	0.0	0.0	0.0	0.0	326890.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7034016.
EXTERNAL TRUCKS	(ET)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.

PORT OUTPUT. BATCH: 2 Priority 1
BEGINNING OF SERVICE: 604800. END OF SERVICE: 636865.
TOTAL SERVICE TIME: 32065. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	503.	503.	504.	489.	519.	766.	765.	763.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.000	2.376	0.009	0.000	0.063	603897.
GANTRY_CRANE_2	0.000	2.709	0.018	0.000	0.080	603897.
GANTRY_CRANE_3	0.979	1.981	0.004	0.000	0.103	603897.
YARD_TRUCK_4	0.770	0.128	0.204	0.000	1.364	603897.
YARD_TRUCK_5	0.896	0.095	0.151	0.000	0.627	603897.
YARD_TRUCK_6	0.799	0.137	0.204	0.000	1.123	603897.
YARD_TRUCK_7	1.088	0.162	0.263	0.000	1.591	603897.
YARD_TRUCK_8	1.170	0.164	0.245	0.000	1.198	603897.
YARD_TRUCK_9	1.139	0.169	0.252	0.000	1.366	603897.
YARD_TRUCK_10	1.064	0.156	0.234	0.000	1.171	603897.
YARD_TRUCK_11	1.247	0.167	0.233	0.000	1.184	603897.
YARD_TRUCK_12	1.414	0.208	0.299	0.000	1.917	603897.
YARD_TRUCK_13	0.896	0.105	0.163	0.000	1.056	603897.
YARD_TRUCK_14	0.928	0.155	0.237	0.000	1.085	603897.
YARD_TRUCK_15	0.976	0.180	0.285	0.000	1.424	603897.
YARD_TRUCK_16	0.969	0.220	0.305	0.000	1.274	603897.
YARD_TRUCK_17	1.378	0.157	0.261	0.000	1.220	603897.
YARD_TRUCK_18	0.771	0.146	0.233	0.000	1.036	603897.
YARD_TRUCK_19	0.633	0.141	0.219	0.000	0.943	603897.
YARD_TRUCK_20	1.277	0.139	0.191	0.000	1.202	603897.
YARD_TRUCK_21	1.013	0.146	0.233	0.000	1.114	603897.
YARD_TRUCK_22	95.813	0.152	0.242	0.000	1.194	603897.
YARD_TRUCK_23	0.618	0.135	0.193	0.000	0.929	603897.
YARD_TRUCK_24	1.310	0.204	0.302	0.000	1.269	603897.

YARD_TRUCK_25	1.164	0.166	0.255	0.000	0.973	603897.
YARD_TRUCK_26	1.291	0.193	0.303	0.000	1.321	603897.
YARD_TRUCK_27	1.144	0.141	0.199	0.000	1.034	603897.
YARD_CRANE_28	1.426	6.654	3.786	0.000	0.000	603897.
YARD_CRANE_29	1.606	6.651	3.817	0.000	0.000	603897.
YARD_CRANE_30	1.976	6.407	3.679	0.000	0.000	603897.
YARD_CRANE_31	2.019	6.367	3.263	0.000	0.000	603897.
YARD_CRANE_32	1.812	6.536	3.692	0.000	0.000	603897.
YARD_CRANE_33	2.387	6.484	3.256	0.000	0.000	603897.
GATES_IN_34	8.314	2.270	0.000	0.000	0.000	603897.
GATES_IN_35	8.372	2.268	0.000	0.000	0.000	603897.
GATES_IN_36	8.448	2.186	0.000	0.000	0.000	603897.
GATES_IN_37	8.408	2.251	0.000	0.000	0.000	603897.
GATES_IN_38	9.013	2.166	0.000	0.000	0.000	603897.
GATES_IN_39	11.532	2.159	0.000	0.000	0.000	603897.
GATES_IN_40	97.915	2.073	0.000	0.000	0.000	603897.
GATES_IN_41	97.941	2.042	0.000	0.000	0.000	603897.
GATES_OUT_42	1.831	8.635	0.000	0.000	0.000	603897.
GATES_OUT_43	2.370	8.167	0.000	0.000	0.000	603897.
GATES_OUT_44	1.955	7.984	0.000	0.000	0.000	603897.
GATES_OUT_45	2.407	7.548	0.000	0.000	0.000	603897.
GATES_OUT_46	2.373	7.556	0.000	0.000	0.000	603897.
GATES_OUT_47	3.274	7.357	0.000	0.000	0.000	603897.
GATES_OUT_48	4.979	6.972	0.000	0.000	0.000	603897.
GATES_OUT_49	28.560	6.587	0.000	0.000	0.000	603897.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1483.
YARD TRUCKS	(YT)	98.1	0.0	1.9	0.0	0.0	0.0	0.0	8913449.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	203.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7223922.
EXTERNAL TRUCKS	(ET)	0.0	0.0	98.8	0.4	0.8	0.0	0.0	21943196.

PORT OUTPUT. BATCH: 2 Priority 2
BEGINNING OF SERVICE: 604800. END OF SERVICE: 636865.
TOTAL SERVICE TIME: 32065. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	497.	497.	497.	1514.	1514.	1514.	1514.	1514.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	94.941	2.489	0.024	0.000	0.098	603897.
GANTRY_CRANE_2	94.690	2.438	0.003	0.000	0.062	603897.
GANTRY_CRANE_3	94.690	2.182	0.012	0.000	0.048	603897.
YARD_TRUCK_4	95.861	0.145	0.201	0.000	1.328	603897.
YARD_TRUCK_5	96.007	0.213	0.317	0.000	1.694	603897.
YARD_TRUCK_6	96.011	0.170	0.274	0.000	1.282	603897.
YARD_TRUCK_7	95.729	0.152	0.211	0.000	0.805	603897.
YARD_TRUCK_8	95.712	0.149	0.221	0.000	1.141	603897.
YARD_TRUCK_9	95.721	0.118	0.193	0.000	1.043	603897.
YARD_TRUCK_10	95.963	0.202	0.283	0.000	0.927	603897.
YARD_TRUCK_11	95.669	0.138	0.230	0.000	1.133	603897.

YARD_TRUCK_12	95.347	0.093	0.138	0.000	0.584	603897.
YARD_TRUCK_13	96.046	0.180	0.273	0.000	1.282	603897.
YARD_TRUCK_14	96.031	0.158	0.259	0.000	1.148	603897.
YARD_TRUCK_15	95.843	0.111	0.154	0.000	1.026	603897.
YARD_TRUCK_16	95.922	0.117	0.186	0.000	1.008	603897.
YARD_TRUCK_17	95.503	0.123	0.195	0.000	1.162	603897.
YARD_TRUCK_18	96.184	0.215	0.296	0.000	1.119	603897.
YARD_TRUCK_19	96.312	0.180	0.281	0.000	1.291	603897.
YARD_TRUCK_20	95.581	0.138	0.253	0.000	1.220	603897.
YARD_TRUCK_21	96.101	0.180	0.247	0.000	0.966	603897.
YARD_TRUCK_22	1.163	0.153	0.211	0.000	1.070	603897.
YARD_TRUCK_23	96.207	0.177	0.281	0.000	1.459	603897.
YARD_TRUCK_24	95.582	0.118	0.159	0.000	1.055	603897.
YARD_TRUCK_25	95.861	0.184	0.257	0.000	1.140	603897.
YARD_TRUCK_26	95.682	0.136	0.190	0.000	0.884	603897.
YARD_TRUCK_27	95.746	0.198	0.313	0.000	1.224	603897.
YARD_CRANE_28	71.463	7.857	7.025	0.000	1.789	603897.
YARD_CRANE_29	71.649	7.790	7.064	0.000	1.424	603897.
YARD_CRANE_30	71.233	8.214	7.051	0.000	1.440	603897.
YARD_CRANE_31	69.424	9.463	8.288	0.000	1.176	603897.
YARD_CRANE_32	69.725	9.181	7.985	0.000	1.069	603897.
YARD_CRANE_33	76.314	5.846	4.669	0.000	1.044	603897.
GATES_IN_34	60.300	29.116	0.000	0.000	0.000	603897.
GATES_IN_35	74.035	15.325	0.000	0.000	0.000	603897.
GATES_IN_36	82.128	7.238	0.000	0.000	0.000	603897.
GATES_IN_37	86.596	2.746	0.000	0.000	0.000	603897.
GATES_IN_38	87.740	1.082	0.000	0.000	0.000	603897.
GATES_IN_39	86.155	0.154	0.000	0.000	0.000	603897.
GATES_IN_40	0.000	0.013	0.000	0.000	0.000	603897.
GATES_IN_41	0.000	0.018	0.000	0.000	0.000	603897.
GATES_OUT_42	45.576	43.957	0.000	0.000	0.000	603897.
GATES_OUT_43	59.514	29.948	0.000	0.000	0.000	603897.
GATES_OUT_44	70.777	19.283	0.000	0.000	0.000	603897.
GATES_OUT_45	76.426	13.619	0.000	0.000	0.000	603897.
GATES_OUT_46	81.269	8.802	0.000	0.000	0.000	603897.
GATES_OUT_47	85.445	3.923	0.000	0.000	0.000	603897.
GATES_OUT_48	86.595	1.454	0.000	0.000	0.000	603897.
GATES_OUT_49	64.643	0.209	0.000	0.000	0.000	603897.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1254.
YARD TRUCKS	(YT)	97.0	0.0	3.0	0.0	0.0	0.0	0.0	5457383.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	50838.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7336226.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	230791.

PORT OUTPUT. BATCH: 3 Priority 1
BEGINNING OF SERVICE: 1209600. END OF SERVICE: 1241693.
TOTAL SERVICE TIME: 32093. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	498.	497.	496.	483.	474.	478.	478.	482.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.117	2.371	0.006	0.000	0.158	604828.
GANTRY_CRANE_2	0.000	2.338	0.006	0.000	0.195	604828.
GANTRY_CRANE_3	0.000	2.189	0.013	0.000	0.161	604828.
YARD_TRUCK_4	0.685	0.155	0.211	0.000	1.483	604828.
YARD_TRUCK_5	0.584	0.147	0.189	0.000	1.554	604828.
YARD_TRUCK_6	0.480	0.094	0.151	0.000	1.395	604828.
YARD_TRUCK_7	0.542	0.118	0.164	0.000	1.637	604828.
YARD_TRUCK_8	0.600	0.111	0.176	0.000	1.439	604828.
YARD_TRUCK_9	0.596	0.101	0.183	0.000	1.581	604828.
YARD_TRUCK_10	0.726	0.170	0.223	0.000	1.377	604828.
YARD_TRUCK_11	0.752	0.116	0.185	0.000	1.400	604828.
YARD_TRUCK_12	0.576	0.102	0.163	0.000	0.975	604828.
YARD_TRUCK_13	0.857	0.190	0.252	0.000	1.979	604828.
YARD_TRUCK_14	0.934	0.206	0.275	0.000	2.316	604828.
YARD_TRUCK_15	0.816	0.185	0.219	0.000	1.738	604828.
YARD_TRUCK_16	0.401	0.130	0.176	0.000	1.474	604828.
YARD_TRUCK_17	0.697	0.166	0.221	0.000	1.455	604828.
YARD_TRUCK_18	0.733	0.131	0.211	0.000	1.928	604828.
YARD_TRUCK_19	1.053	0.172	0.216	0.000	1.321	604828.
YARD_TRUCK_20	0.606	0.132	0.184	0.000	1.629	604828.
YARD_TRUCK_21	1.026	0.208	0.271	0.000	2.131	604828.
YARD_TRUCK_22	0.949	0.164	0.249	0.000	1.573	604828.
YARD_TRUCK_23	0.846	0.178	0.271	0.000	1.446	604828.
YARD_TRUCK_24	0.575	0.133	0.203	0.000	1.868	604828.
YARD_TRUCK_25	1.004	0.188	0.289	0.000	1.720	604828.
YARD_TRUCK_26	0.781	0.134	0.202	0.000	1.348	604828.
YARD_TRUCK_27	0.408	0.135	0.194	0.000	1.949	604828.
YARD_CRANE_28	18.604	4.747	2.741	0.000	0.000	604828.
YARD_CRANE_29	18.945	4.946	2.543	0.000	0.000	604828.
YARD_CRANE_30	19.613	4.767	2.764	0.000	0.000	604828.
YARD_CRANE_31	20.574	4.836	2.256	0.000	0.000	604828.
YARD_CRANE_32	18.894	4.805	1.941	0.000	0.000	604828.
YARD_CRANE_33	22.019	4.781	2.094	0.000	0.000	604828.
GATES_IN_34	22.648	2.331	0.000	0.000	0.000	604828.
GATES_IN_35	24.478	2.306	0.000	0.000	0.000	604828.
GATES_IN_36	27.357	2.331	0.000	0.000	0.000	604828.
GATES_IN_37	97.734	2.244	0.000	0.000	0.000	604828.
GATES_IN_38	97.752	2.245	0.000	0.000	0.000	604828.
GATES_IN_39	97.843	2.134	0.000	0.000	0.000	604828.
GATES_IN_40	97.912	2.040	0.000	0.000	0.000	604828.
GATES_IN_41	98.059	1.932	0.000	0.000	0.000	604828.
GATES_OUT_42	19.476	5.407	0.000	0.000	0.000	604828.
GATES_OUT_43	19.885	4.994	0.000	0.000	0.000	604828.
GATES_OUT_44	19.956	4.926	0.000	0.000	0.000	604828.
GATES_OUT_45	41.311	4.681	0.000	0.000	0.000	604828.
GATES_OUT_46	40.024	4.721	0.000	0.000	0.000	604828.
GATES_OUT_47	95.431	4.477	0.000	0.000	0.000	604828.
GATES_OUT_48	95.552	4.373	0.000	0.000	0.000	604828.
GATES_OUT_49	95.453	4.489	0.000	0.000	0.000	604828.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	3111.
YARD TRUCKS	(YT)	95.3	0.0	4.7	0.0	0.0	0.0	0.0	4922691.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7352817.
EXTERNAL TRUCKS	(ET)	0.0	0.0	98.1	0.6	1.4	0.0	0.0	7837639.

PORT OUTPUT. BATCH: 3 Priority 2
BEGINNING OF SERVICE: 1209600. END OF SERVICE: 1241693.
TOTAL SERVICE TIME: 32093. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	502.	503.	499.	497.	497.	497.	497.	497.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	94.694	2.487	0.012	0.000	0.155	604828.
GANTRY_CRANE_2	94.694	2.585	0.011	0.000	0.171	604828.
GANTRY_CRANE_3	95.400	2.110	0.002	0.000	0.124	604828.
YARD_TRUCK_4	95.705	0.156	0.215	0.000	1.389	604828.
YARD_TRUCK_5	95.576	0.136	0.229	0.000	1.584	604828.
YARD_TRUCK_6	95.748	0.171	0.279	0.000	1.681	604828.
YARD_TRUCK_7	95.519	0.145	0.204	0.000	1.671	604828.
YARD_TRUCK_8	95.585	0.144	0.207	0.000	1.738	604828.
YARD_TRUCK_9	95.502	0.175	0.221	0.000	1.642	604828.
YARD_TRUCK_10	95.623	0.160	0.241	0.000	1.479	604828.
YARD_TRUCK_11	95.440	0.173	0.234	0.000	1.701	604828.
YARD_TRUCK_12	95.683	0.203	0.306	0.000	1.991	604828.
YARD_TRUCK_13	95.314	0.108	0.210	0.000	1.089	604828.
YARD_TRUCK_14	95.409	0.111	0.139	0.000	0.611	604828.
YARD_TRUCK_15	95.588	0.166	0.245	0.000	1.043	604828.
YARD_TRUCK_16	95.791	0.171	0.258	0.000	1.598	604828.
YARD_TRUCK_17	95.666	0.174	0.251	0.000	1.370	604828.
YARD_TRUCK_18	95.374	0.149	0.177	0.000	1.296	604828.
YARD_TRUCK_19	95.221	0.137	0.179	0.000	1.701	604828.
YARD_TRUCK_20	95.551	0.132	0.208	0.000	1.558	604828.
YARD_TRUCK_21	95.047	0.088	0.171	0.000	1.058	604828.
YARD_TRUCK_22	95.231	0.129	0.190	0.000	1.515	604828.
YARD_TRUCK_23	95.412	0.170	0.180	0.000	1.498	604828.
YARD_TRUCK_24	95.381	0.116	0.174	0.000	1.549	604828.
YARD_TRUCK_25	95.321	0.142	0.201	0.000	1.136	604828.
YARD_TRUCK_26	95.396	0.161	0.240	0.000	1.738	604828.
YARD_TRUCK_27	95.649	0.161	0.225	0.000	1.280	604828.
YARD_CRANE_28	67.006	3.876	2.435	0.000	0.592	604828.
YARD_CRANE_29	66.202	4.121	2.854	0.000	0.389	604828.
YARD_CRANE_30	67.123	3.176	2.054	0.000	0.504	604828.
YARD_CRANE_31	64.898	3.834	2.893	0.000	0.708	604828.
YARD_CRANE_32	65.605	5.298	2.770	0.000	0.687	604828.
YARD_CRANE_33	66.094	3.317	1.226	0.000	0.469	604828.
GATES_IN_34	60.804	14.216	0.000	0.000	0.000	604828.
GATES_IN_35	69.756	3.460	0.000	0.000	0.000	604828.
GATES_IN_36	69.847	0.466	0.000	0.000	0.000	604828.
GATES_IN_37	0.000	0.023	0.000	0.000	0.000	604828.

GATES_IN_38	0.000	0.003	0.000	0.000	0.000	604828.
GATES_IN_39	0.000	0.022	0.000	0.000	0.000	604828.
GATES_IN_40	0.000	0.048	0.000	0.000	0.000	604828.
GATES_IN_41	0.010	0.000	0.000	0.000	0.000	604828.
GATES_OUT_42	48.637	26.479	0.000	0.000	0.000	604828.
GATES_OUT_43	64.211	10.910	0.000	0.000	0.000	604828.
GATES_OUT_44	72.083	3.035	0.000	0.000	0.000	604828.
GATES_OUT_45	53.513	0.495	0.000	0.000	0.000	604828.
GATES_OUT_46	55.022	0.233	0.000	0.000	0.000	604828.
GATES_OUT_47	0.000	0.092	0.000	0.000	0.000	604828.
GATES_OUT_48	0.000	0.074	0.000	0.000	0.000	604828.
GATES_OUT_49	0.000	0.058	0.000	0.000	0.000	604828.

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	2721.
YARD TRUCKS	(YT)	97.8	0.0	2.2	0.0	0.0	0.0	0.0	9496754.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	21162.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7189180.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	47067.

PORT OUTPUT. BATCH: 4 Priority 1
BEGINNING OF SERVICE: 1814400. END OF SERVICE: 1854539.
TOTAL SERVICE TIME: 40139. TOTAL WAITING TIME: 0.
SERVER: G_CRAN Y_TRCK YC_S#3 GATE_I TRK_IN YC_S#9 TRK_OU GATE_O
OUTPUT: 526. 527. 528. 693. 689. 580. 581. 578.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	93.450	2.428	0.006	0.000	0.332	612846.
GANTRY_CRANE_2	94.116	2.593	0.017	0.375	0.286	612846.
GANTRY_CRANE_3	93.450	2.195	0.003	0.000	0.326	612846.
YARD_TRUCK_4	95.072	0.146	0.194	0.000	2.951	612846.
YARD_TRUCK_5	94.765	0.159	0.210	0.000	0.954	612846.
YARD_TRUCK_6	94.831	0.097	0.193	0.000	2.900	612846.
YARD_TRUCK_7	94.991	0.175	0.247	0.000	1.712	612846.
YARD_TRUCK_8	95.485	0.133	0.238	0.000	1.172	612846.
YARD_TRUCK_9	94.849	0.153	0.239	0.000	1.785	612846.
YARD_TRUCK_10	94.759	0.134	0.225	0.000	1.477	612846.
YARD_TRUCK_11	94.762	0.064	0.141	0.000	0.815	612846.
YARD_TRUCK_12	95.039	0.211	0.303	0.000	1.971	612846.
YARD_TRUCK_13	0.708	0.108	0.136	0.000	1.121	612846.
YARD_TRUCK_14	95.225	0.159	0.252	0.000	1.664	612846.
YARD_TRUCK_15	94.599	0.109	0.183	0.000	1.591	612846.
YARD_TRUCK_16	94.934	0.180	0.251	0.000	2.000	612846.
YARD_TRUCK_17	94.776	0.160	0.229	0.000	1.946	612846.
YARD_TRUCK_18	1.036	0.157	0.214	0.000	1.918	612846.
YARD_TRUCK_19	94.425	0.168	0.228	0.000	1.466	612846.
YARD_TRUCK_20	95.031	0.191	0.256	0.000	1.207	612846.
YARD_TRUCK_21	94.715	0.154	0.265	0.000	2.290	612846.
YARD_TRUCK_22	94.811	0.206	0.280	0.000	1.849	612846.
YARD_TRUCK_23	1.240	0.163	0.227	0.000	1.402	612846.
YARD_TRUCK_24	94.909	0.112	0.190	0.000	2.903	612846.

YARD_TRUCK_25	94.522	0.171	0.278	0.000	2.135	612846.
YARD_TRUCK_26	1.497	0.152	0.234	0.000	1.973	612846.
YARD_TRUCK_27	94.529	0.134	0.203	0.000	1.644	612846.
YARD_CRANE_28	18.046	5.824	2.865	0.000	0.000	612846.
YARD_CRANE_29	18.590	5.501	3.063	0.000	0.000	612846.
YARD_CRANE_30	19.545	5.208	3.029	0.000	0.033	612846.
YARD_CRANE_31	19.174	5.716	2.331	0.000	0.042	612846.
YARD_CRANE_32	22.150	5.309	2.471	0.000	0.000	612846.
YARD_CRANE_33	20.240	6.296	2.367	0.000	0.000	612846.
GATES_IN_34	22.848	3.135	0.000	0.000	0.000	612846.
GATES_IN_35	22.948	3.149	0.000	0.000	0.000	612846.
GATES_IN_36	25.105	3.086	0.000	0.000	0.000	612846.
GATES_IN_37	26.606	3.145	0.000	0.000	0.000	612846.
GATES_IN_38	96.924	3.076	0.000	0.000	0.000	612846.
GATES_IN_39	96.962	3.038	0.000	0.000	0.000	612846.
GATES_IN_40	96.900	3.100	0.000	0.000	0.000	612846.
GATES_IN_41	96.992	3.008	0.000	0.000	0.000	612846.
GATES_OUT_42	18.815	7.168	0.000	0.000	0.000	612846.
GATES_OUT_43	19.313	6.643	0.000	0.000	0.000	612846.
GATES_OUT_44	21.664	6.383	0.000	0.000	0.000	612846.
GATES_OUT_45	23.760	5.906	0.000	0.000	0.000	612846.
GATES_OUT_46	51.829	5.432	0.000	0.000	0.000	612846.
GATES_OUT_47	95.060	4.940	0.000	0.000	0.000	612846.
GATES_OUT_48	95.254	4.746	0.000	0.000	0.000	612846.
GATES_OUT_49	95.452	4.548	0.000	0.000	0.000	612846.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5783.
YARD TRUCKS	(YT)	96.9	0.0	3.1	0.0	0.0	0.0	0.0	8466303.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	503.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	9424008.
EXTERNAL TRUCKS	(ET)	0.0	0.0	97.5	2.1	0.4	0.0	0.0	9424699.

PORT OUTPUT. BATCH: 4 Priority 2
BEGINNING OF SERVICE: 1814400. END OF SERVICE: 1854539.
TOTAL SERVICE TIME: 40139. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	474.	473.	476.	502.	502.	502.	502.	502.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.000	2.343	0.014	1.150	0.277	612846.
GANTRY_CRANE_2	0.000	2.320	0.003	0.000	0.290	612846.
GANTRY_CRANE_3	1.908	1.813	0.013	0.000	0.293	612846.
YARD_TRUCK_4	0.968	0.065	0.112	0.000	0.492	612846.
YARD_TRUCK_5	1.453	0.179	0.259	0.000	2.022	612846.
YARD_TRUCK_6	1.252	0.093	0.128	0.000	0.506	612846.
YARD_TRUCK_7	1.067	0.133	0.209	0.000	1.466	612846.
YARD_TRUCK_8	0.784	0.114	0.175	0.000	1.901	612846.
YARD_TRUCK_9	1.302	0.132	0.190	0.000	1.350	612846.
YARD_TRUCK_10	1.322	0.130	0.202	0.000	1.752	612846.
YARD_TRUCK_11	1.289	0.121	0.166	0.000	2.641	612846.

YARD_TRUCK_12	1.142	0.132	0.185	0.000	1.018	612846.
YARD_TRUCK_13	95.255	0.183	0.297	0.000	2.192	612846.
YARD_TRUCK_14	0.918	0.128	0.182	0.000	1.470	612846.
YARD_TRUCK_15	1.477	0.132	0.243	0.000	1.665	612846.
YARD_TRUCK_16	1.200	0.139	0.192	0.000	1.104	612846.
YARD_TRUCK_17	1.329	0.145	0.226	0.000	1.189	612846.
YARD_TRUCK_18	94.923	0.148	0.237	0.000	1.367	612846.
YARD_TRUCK_19	1.811	0.199	0.288	0.000	1.415	612846.
YARD_TRUCK_20	1.184	0.152	0.249	0.000	1.730	612846.
YARD_TRUCK_21	1.414	0.137	0.166	0.000	0.860	612846.
YARD_TRUCK_22	1.422	0.165	0.257	0.000	1.011	612846.
YARD_TRUCK_23	94.906	0.171	0.267	0.000	1.624	612846.
YARD_TRUCK_24	1.091	0.081	0.101	0.000	0.613	612846.
YARD_TRUCK_25	1.541	0.121	0.206	0.000	1.026	612846.
YARD_TRUCK_26	94.668	0.129	0.224	0.000	1.124	612846.
YARD_TRUCK_27	1.591	0.139	0.221	0.000	1.539	612846.
YARD_CRANE_28	64.888	4.577	3.125	0.000	0.675	612846.
YARD_CRANE_29	64.905	4.112	3.395	0.000	0.435	612846.
YARD_CRANE_30	64.282	4.017	3.006	0.282	0.598	612846.
YARD_CRANE_31	64.822	4.314	2.763	0.000	0.838	612846.
YARD_CRANE_32	65.296	3.267	1.195	0.000	0.312	612846.
YARD_CRANE_33	66.567	2.865	1.353	0.000	0.312	612846.
GATES_IN_34	59.875	14.143	0.000	0.000	0.000	612846.
GATES_IN_35	70.450	3.453	0.000	0.000	0.000	612846.
GATES_IN_36	71.452	0.357	0.000	0.000	0.000	612846.
GATES_IN_37	70.213	0.036	0.000	0.000	0.000	612846.
GATES_IN_38	0.000	0.000	0.000	0.000	0.000	612846.
GATES_IN_39	0.000	0.000	0.000	0.000	0.000	612846.
GATES_IN_40	0.000	0.000	0.000	0.000	0.000	612846.
GATES_IN_41	0.000	0.000	0.000	0.000	0.000	612846.
GATES_OUT_42	48.375	25.642	0.000	0.000	0.000	612846.
GATES_OUT_43	63.195	10.849	0.000	0.000	0.000	612846.
GATES_OUT_44	69.095	2.858	0.000	0.000	0.000	612846.
GATES_OUT_45	69.760	0.575	0.000	0.000	0.000	612846.
GATES_OUT_46	42.704	0.035	0.000	0.000	0.000	612846.
GATES_OUT_47	0.000	0.000	0.000	0.000	0.000	612846.
GATES_OUT_48	0.000	0.000	0.000	0.000	0.000	612846.
GATES_OUT_49	0.000	0.000	0.000	0.000	0.000	612846.

		---- % OF TIME WAITING FOR : ----						
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	5269.
YARD TRUCKS	(YT)	96.7	0.0	3.3	0.0	0.0	0.0	0.0	6126829.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	20485.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	9187779.
EXTERNAL TRUCKS	(ET)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	52881.

PORT OUTPUT. BATCH: 5 Priority 1
BEGINNING OF SERVICE: 2419200. END OF SERVICE: 2451511.
TOTAL SERVICE TIME: 32311. TOTAL WAITING TIME: 0.

SERVER:	G_CRAN	Y_TRCK	YC_S#3	GATE_I	TRK_IN	YC_S#9	TRK_OU	GATE_O
OUTPUT:	505.	504.	504.	368.	371.	449.	449.	450.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	0.167	2.472	0.027	0.000	0.133	596972.
GANTRY_CRANE_2	0.000	2.692	0.021	0.000	0.123	596972.
GANTRY_CRANE_3	0.700	2.035	0.006	0.157	0.101	596972.
YARD_TRUCK_4	0.768	0.155	0.249	0.000	1.658	596972.
YARD_TRUCK_5	0.603	0.157	0.202	0.000	1.086	596972.
YARD_TRUCK_6	0.744	0.108	0.165	0.000	1.147	596972.
YARD_TRUCK_7	1.070	0.170	0.291	0.000	1.939	596972.
YARD_TRUCK_8	0.747	0.146	0.190	0.000	1.386	596972.
YARD_TRUCK_9	1.249	0.173	0.255	0.000	1.842	596972.
YARD_TRUCK_10	1.100	0.178	0.269	0.000	1.593	596972.
YARD_TRUCK_11	1.470	0.191	0.298	0.000	1.828	596972.
YARD_TRUCK_12	0.777	0.164	0.240	0.000	1.738	596972.
YARD_TRUCK_13	0.745	0.120	0.164	0.000	0.954	596972.
YARD_TRUCK_14	0.621	0.170	0.253	0.000	1.224	596972.
YARD_TRUCK_15	1.033	0.210	0.274	0.000	1.773	596972.
YARD_TRUCK_16	1.119	0.176	0.236	0.000	1.459	596972.
YARD_TRUCK_17	0.872	0.135	0.190	0.000	1.434	596972.
YARD_TRUCK_18	1.098	0.161	0.234	0.000	1.527	596972.
YARD_TRUCK_19	0.780	0.112	0.146	0.000	1.216	596972.
YARD_TRUCK_20	1.008	0.190	0.237	0.000	1.491	596972.
YARD_TRUCK_21	0.756	0.087	0.164	0.000	1.102	596972.
YARD_TRUCK_22	0.838	0.126	0.189	0.000	1.206	596972.
YARD_TRUCK_23	1.017	0.138	0.233	0.000	1.131	596972.
YARD_TRUCK_24	0.976	0.141	0.217	0.000	1.209	596972.
YARD_TRUCK_25	0.861	0.156	0.224	0.000	1.120	596972.
YARD_TRUCK_26	0.911	0.138	0.188	0.000	1.348	596972.
YARD_TRUCK_27	0.863	0.119	0.177	0.000	1.069	596972.
YARD_CRANE_28	17.730	5.329	2.099	0.000	0.000	596972.
YARD_CRANE_29	18.578	4.767	2.416	0.000	0.000	596972.
YARD_CRANE_30	20.302	4.846	2.225	0.000	0.000	596972.
YARD_CRANE_31	18.249	5.239	2.124	0.000	0.000	596972.
YARD_CRANE_32	21.042	4.848	2.215	0.000	0.000	596972.
YARD_CRANE_33	18.271	4.729	2.124	0.000	0.000	596972.
GATES_IN_34	0.036	1.757	0.000	0.000	0.000	596972.
GATES_IN_35	0.052	1.737	0.000	0.000	0.000	596972.
GATES_IN_36	0.058	1.723	0.000	0.000	0.000	596972.
GATES_IN_37	0.045	1.735	0.000	0.000	0.000	596972.
GATES_IN_38	0.110	1.665	0.000	0.000	0.000	596972.
GATES_IN_39	0.127	1.648	0.000	0.000	0.000	596972.
GATES_IN_40	0.087	1.688	0.000	0.000	0.000	596972.
GATES_IN_41	0.129	1.640	0.000	0.000	0.000	596972.
GATES_OUT_42	18.717	5.238	0.000	0.000	0.000	596972.
GATES_OUT_43	18.970	5.050	0.000	0.000	0.000	596972.
GATES_OUT_44	21.556	4.792	0.000	0.000	0.000	596972.
GATES_OUT_45	21.938	4.434	0.000	0.000	0.000	596972.
GATES_OUT_46	95.708	4.246	0.000	0.000	0.000	596972.
GATES_OUT_47	95.881	4.100	0.000	0.000	0.000	596972.
GATES_OUT_48	95.792	4.135	0.000	0.000	0.000	596972.
GATES_OUT_49	96.127	3.723	0.000	0.000	0.000	596972.

		---- % OF TIME WAITING FOR : ----							
		G_C	Y_T	Y_C	G_I	G_O	TEU	E_T	-TOTAL-
GANTRY CRANES	(GC)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	2131.
YARD TRUCKS	(YT)	97.7	0.0	2.3	0.0	0.0	0.0	0.0	8809135.
YARD CRANES	(YC)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	5.
GATES -IN-	(GI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
GATES -OUT-	(GO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TEU ON SHIP	(TEU)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	7499527.
EXTERNAL TRUCKS	(ET)	0.0	0.0	99.2	0.5	0.3	0.0	0.0	10250459.

PORT OUTPUT. BATCH: 5 Priority 2
BEGINNING OF SERVICE: 2419200. END OF SERVICE: 2451511.
TOTAL SERVICE TIME: 32311. TOTAL WAITING TIME: 0.
SERVER: G_CRAN Y_TRCK YC_S#3 GATE_I TRK_IN YC_S#9 TRK_OU GATE_O
OUTPUT: 495. 496. 496. 474. 474. 474. 474. 474.

	PERCENTAGES OF TOTAL TIME/SERVER STATUS					
SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAITING	END-END
GANTRY_CRANE_1	94.588	2.514	0.007	0.000	0.093	596972.
GANTRY_CRANE_2	94.588	2.462	0.025	0.000	0.090	596972.
GANTRY_CRANE_3	94.588	2.299	0.010	0.000	0.104	596972.
YARD_TRUCK_4	95.633	0.153	0.195	0.000	1.188	596972.
YARD_TRUCK_5	95.912	0.179	0.265	0.000	1.597	596972.
YARD_TRUCK_6	95.808	0.167	0.266	0.000	1.594	596972.
YARD_TRUCK_7	95.426	0.129	0.151	0.000	0.824	596972.
YARD_TRUCK_8	95.645	0.126	0.200	0.000	1.559	596972.
YARD_TRUCK_9	95.237	0.110	0.172	0.000	0.962	596972.
YARD_TRUCK_10	95.289	0.132	0.182	0.000	1.257	596972.
YARD_TRUCK_11	95.162	0.108	0.151	0.000	0.793	596972.
YARD_TRUCK_12	95.647	0.138	0.213	0.000	1.083	596972.
YARD_TRUCK_13	95.611	0.143	0.227	0.000	2.035	596972.
YARD_TRUCK_14	96.033	0.171	0.228	0.000	1.300	596972.
YARD_TRUCK_15	95.383	0.133	0.167	0.000	1.027	596972.
YARD_TRUCK_16	95.286	0.149	0.210	0.000	1.366	596972.
YARD_TRUCK_17	95.359	0.131	0.203	0.000	1.676	596972.
YARD_TRUCK_18	95.432	0.164	0.241	0.000	1.143	596972.
YARD_TRUCK_19	95.604	0.178	0.272	0.000	1.692	596972.
YARD_TRUCK_20	95.452	0.130	0.224	0.000	1.268	596972.
YARD_TRUCK_21	95.611	0.194	0.286	0.000	1.799	596972.
YARD_TRUCK_22	95.585	0.162	0.221	0.000	1.673	596972.
YARD_TRUCK_23	95.502	0.154	0.225	0.000	1.601	596972.
YARD_TRUCK_24	95.484	0.206	0.260	0.000	1.507	596972.
YARD_TRUCK_25	95.676	0.178	0.223	0.000	1.561	596972.
YARD_TRUCK_26	95.403	0.132	0.217	0.000	1.662	596972.
YARD_TRUCK_27	95.515	0.167	0.194	0.000	1.896	596972.
YARD_CRANE_28	68.053	4.065	2.215	0.000	0.509	596972.
YARD_CRANE_29	65.633	4.728	3.414	0.000	0.463	596972.
YARD_CRANE_30	64.584	4.652	2.751	0.000	0.639	596972.
YARD_CRANE_31	66.979	3.656	2.685	0.138	0.930	596972.
YARD_CRANE_32	68.770	2.447	0.377	0.000	0.301	596972.
YARD_CRANE_33	66.798	4.431	2.733	0.369	0.545	596972.
GATES_IN_34	84.425	13.782	0.000	0.000	0.000	596972.
GATES_IN_35	94.802	3.408	0.000	0.000	0.000	596972.
GATES_IN_36	97.780	0.439	0.000	0.000	0.000	596972.
GATES_IN_37	98.220	0.000	0.000	0.000	0.000	596972.

```
GATES_IN_38      98.225    0.000    0.000    0.000    0.000    596972.
GATES_IN_39      98.225    0.000    0.000    0.000    0.000    596972.
GATES_IN_40      98.226    0.000    0.000    0.000    0.000    596972.
GATES_IN_41      98.230    0.000    0.000    0.000    0.000    596972.
GATES_OUT_42     50.536   25.509    0.000    0.000    0.000    596972.
GATES_OUT_43     65.600   10.380    0.000    0.000    0.000    596972.
GATES_OUT_44     70.803    2.848    0.000    0.000    0.000    596972.
GATES_OUT_45     73.041    0.586    0.000    0.000    0.000    596972.
GATES_OUT_46      0.000    0.046    0.000    0.000    0.000    596972.
GATES_OUT_47      0.000    0.019    0.000    0.000    0.000    596972.
GATES_OUT_48      0.000    0.073    0.000    0.000    0.000    596972.
GATES_OUT_49      0.150    0.000    0.000    0.000    0.000    596972.

                        ---- % OF TIME WAITING FOR : ----
                        G_C   Y_T   Y_C   G_I   G_O   TEU   E_T   -TOTAL-
GANTRY CRANES    (GC)   0.0100.0   0.0   0.0   0.0   0.0   0.0     1705.
YARD TRUCKS      (YT)  96.2   0.0   3.8   0.0   0.0   0.0   0.0  5413278.
YARD CRANES      (YC)   0.0   0.0   0.0   0.0   0.0   0.0100.0    21200.
GATES -IN-       (GI)   0.0   0.0   0.0   0.0   0.0   0.0   0.0        0.
GATES -OUT-      (GO)   0.0   0.0   0.0   0.0   0.0   0.0   0.0        0.
TEU ON SHIP    (TEU)100.0   0.0   0.0   0.0   0.0   0.0   0.0  7516887.
EXTERNAL TRUCKS  (ET)   0.0   0.0100.0   0.0   0.0   0.0   0.0    51476.
```

2.4 ECON: TYPICAL INPUT FILES

ECON uses two input files. The first input file is the control file for ECON, ECON.DAT, which contains the unit costs used by ECON as well as general economic information. The second one contains the output of the simulation system, ECON.EXAM. Since an example of ECON.EXAM was presented in section 2.3.4 it will not be repeated here.

2.4.1 ECON.DAT

```
FILE: ECON.DAT
 It contains data corresponding to economic information
 In two sections: a) equipment costs and b) gangs

 A) CONTROL INFORMATION
  Input file (from PRIOR)                : ECON.EXAM
  Output file containing detailed costs: EC_D.EXAM
  Output file containing summary         : EC_S.EXAM

 B) FINANCIAL COSTS:
  Opportunity cost (%/year)       (RATE):      0.12
  Cargo value. Priority 1 ($/t)    (CV1):  10000.00
  Cargo value. Priority 2 ($/t)    (CV2):   1000.00
  Weight of 40' container (t)   (WEIGHT):     20.00

 C) EQUIPMENT HOURLY COSTS ($/hour):
  Ship                             (SH_C):   3125.00
  Gantry crane                     (GC_C):    410.00
  Yard crane                       (YC_C):    250.00
  Yard trucks/external trucks      (YT_C):     15.00
```

```
D) LABOUR COSTS ($/hour):
 Gantry crane operator          (GC_L):     73.66
 Yard crane operator            (YC_L):     73.66
 Longshoreman                   (LO_L):     65.51
 Foreman                        (FO_L):     94.88
 Yard trucks                    (YT_L):     67.25
 Clerk                          (CL_L):     65.51
 Checker                        (CH_L):     65.51
 SuperCargo                     (SU_L):     89.04
 Lash leader                    (LL_L):     86.52
 Lasher                         (LA_L):     65.51
 Top lift/Straddle c. driver    (TL_L):     67.25
 Repair time                    (RE_L):    150.00
```

2.5 ECON: TYPICAL OUTPUT FILES

ECON produces two output files. The first one contains the detailed costs for each observation while the second one contains the summary of total costs.

2.5.1 EC_D.EXAM

```
FILE: EC_D.EXAM
OPERATIONAL PARAMETERS :
CREATION : RANDOM  / LOT_ASSIG: P_RANDOM/ G_CRANE  : B_CASE  /
Y_CRANE  : B_CASE  / GATES IN : B_CASE  / GATES OUT: B_CASE  /

MAIN CHARACTERISTICS OF THE RUN:
 3  GANTRY CRANES  / 24  YARD TRUCKS    /  6   YARD CRANES   /
 8  YARD GATES-IN  /  8 YARD GATES-OUT  / 10 LAYERS ON SHIP  /

BATCH NUMBER:     1                                PRIORITY NUMBER:  1

                        UNIT COSTS PER EQUIPMENT /SERVER STATUS
SERVER:            IDLE    BUSY REPOSIT. BROKEN WAIT-EQ WAIT-US   TOTAL
SHIPS              0.00    9.62    0.00    0.00    0.00    0.00    9.62
GANTRY CRANES      0.00   71.80    0.22    0.00    9.34    0.00   81.36
YARD TRUCKS        0.00    4.47    6.22    0.00   44.86    0.02   55.57
YARD CRANES        0.00   18.43    5.73    0.00    0.00    0.00   24.16
GATES -IN-         0.00    8.21    0.00    0.00    0.00    0.00    8.21
GATES -OUT-        0.00   77.80    0.00    0.00    0.00    0.00   77.80
EXT. TRUCK -IN-    0.00    0.00    0.00    0.00    0.13    0.00    0.13
EXT.TRUCK -OUT-    0.00    0.00    0.00    0.00    0.00    0.00    0.00
UNIT TOTAL COST    0.00  190.32   12.17    0.00   54.33    0.02  256.84

BATCH NUMBER:     1                                PRIORITY NUMBER:  2

                        UNIT COSTS PER EQUIPMENT /SERVER STATUS
SERVER:            IDLE    BUSY REPOSIT. BROKEN WAIT-EQ WAIT-US   TOTAL
SHIPS              0.00    9.62    0.00    0.00    0.00    0.00    9.62
GANTRY CRANES      0.00   75.10    0.29    0.00    6.85    0.00   82.24
YARD TRUCKS        0.00    4.71    6.30    0.00   45.26    0.00   56.28
YARD CRANES        0.00   17.88    4.68    0.00    0.00    0.00   22.57
GATES -IN-         0.00    0.00    0.00    0.00    0.00    0.00    0.00
```

GATES -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	107.31	11.28	0.00	52.11	0.00	170.70

BATCH NUMBER: 2 PRIORITY NUMBER: 1

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.35	0.00	0.00	0.00	0.00	9.35
GANTRY CRANES	0.00	73.64	0.32	0.00	2.56	0.00	76.53
YARD TRUCKS	0.00	4.33	6.56	0.00	32.91	0.01	43.82
YARD CRANES	0.00	24.98	13.73	0.00	0.00	0.00	38.71
GATES -IN-	0.00	7.93	0.00	0.00	0.00	0.00	7.93
GATES -OUT-	0.00	47.65	0.00	0.00	0.00	0.00	47.65
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.01	0.00	0.01
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	167.89	20.62	0.00	35.49	0.01	224.01

BATCH NUMBER: 2 PRIORITY NUMBER: 2

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.35	0.00	0.00	0.00	0.00	9.35
GANTRY CRANES	0.00	74.98	0.41	0.00	2.19	0.00	77.59
YARD TRUCKS	0.00	4.36	6.55	0.00	31.42	0.00	42.33
YARD CRANES	0.00	19.51	16.98	0.00	3.20	0.00	39.69
GATES -IN-	0.00	8.19	0.00	0.00	0.00	0.00	8.19
GATES -OUT-	0.00	46.32	0.00	0.00	0.00	0.00	46.32
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.01	0.00	0.01
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	162.72	23.93	0.00	36.82	0.00	223.48

BATCH NUMBER: 3 PRIORITY NUMBER: 1

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.36	0.00	0.00	0.00	0.00	9.36
GANTRY CRANES	0.00	72.72	0.26	0.00	5.42	0.00	78.41
YARD TRUCKS	0.00	4.16	5.92	0.00	45.14	0.02	55.23
YARD CRANES	0.00	24.10	11.96	0.00	0.00	0.00	36.06
GATES -IN-	0.00	8.11	0.00	0.00	0.00	0.00	8.11
GATES -OUT-	0.00	48.09	0.00	0.00	0.00	0.00	48.09
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	166.53	18.15	0.00	50.58	0.02	235.27

BATCH NUMBER: 3 PRIORITY NUMBER: 2

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.36	0.00	0.00	0.00	0.00	9.36
GANTRY CRANES	0.00	75.11	0.26	0.00	4.71	0.00	80.08
YARD TRUCKS	0.00	4.12	5.97	0.00	40.22	0.00	50.32
YARD CRANES	0.00	19.27	11.61	0.00	2.73	0.00	33.62

GATES -IN-	0.00	8.18	0.00	0.00	0.00	0.00	8.18
GATES -OUT-	0.00	48.24	0.00	0.00	0.00	0.00	48.24
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	164.29	17.84	0.00	47.68	0.00	229.82

BATCH NUMBER: 4 PRIORITY NUMBER: 1

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	11.71	0.00	0.00	0.00	0.00	11.71
GANTRY CRANES	0.00	72.98	0.26	0.08	9.55	0.00	82.87
YARD TRUCKS	0.00	4.01	6.03	0.00	47.73	0.02	57.79
YARD CRANES	0.00	25.16	11.98	0.00	0.06	0.00	37.20
GATES -IN-	0.00	8.07	0.00	0.00	0.00	0.00	8.07
GATES -OUT-	0.00	49.54	0.00	0.00	0.00	0.00	49.54
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	171.46	18.28	0.08	57.35	0.02	247.20

BATCH NUMBER: 4 PRIORITY NUMBER: 2

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	11.71	0.00	0.00	0.00	0.00	11.71
GANTRY CRANES	0.00	72.68	0.34	0.28	9.65	0.00	82.95
YARD TRUCKS	0.00	4.06	6.18	0.00	41.06	0.00	51.30
YARD CRANES	0.00	19.49	12.49	0.03	2.67	0.00	34.68
GATES -IN-	0.00	8.10	0.00	0.00	0.00	0.00	8.10
GATES -OUT-	0.00	46.73	0.00	0.00	0.00	0.00	46.73
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	162.77	19.01	0.31	53.40	0.00	235.49

BATCH NUMBER: 5 PRIORITY NUMBER: 1

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.43	0.00	0.00	0.00	0.00	9.43
GANTRY CRANES	0.00	73.87	0.55	0.03	3.66	0.00	78.12
YARD TRUCKS	0.00	4.11	6.00	0.00	37.99	0.02	48.11
YARD CRANES	0.00	25.04	11.11	0.00	0.00	0.00	36.16
GATES -IN-	0.00	8.13	0.00	0.00	0.00	0.00	8.13
GATES -OUT-	0.00	47.48	0.00	0.00	0.00	0.00	47.48
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	168.06	17.66	0.03	41.67	0.02	227.45

BATCH NUMBER: 5 PRIORITY NUMBER: 2

UNIT COSTS PER EQUIPMENT /SERVER STATUS

SERVER:	IDLE	BUSY	REPOSIT.	BROKEN	WAIT-EQ	WAIT-US	TOTAL
SHIPS	0.00	9.43	0.00	0.00	0.00	0.00	9.43
GANTRY CRANES	0.00	76.16	0.44	0.00	3.00	0.00	79.60
YARD TRUCKS	0.00	4.19	5.99	0.00	39.28	0.00	49.45

YARD CRANES	0.00	19.83	11.72	0.06	2.80	0.00	34.41
GATES -IN-	0.00	8.19	0.00	0.00	0.00	0.00	8.19
GATES -OUT-	0.00	47.61	0.00	0.00	0.00	0.00	47.61
EXT. TRUCK -IN-	0.00	0.00	0.00	0.00	0.02	0.00	0.02
EXT.TRUCK -OUT-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIT TOTAL COST	0.00	165.40	18.15	0.06	45.10	0.00	228.71

2.5.2 EC_S.EXAM

Note: Since the number of columns of the output exceeds the number of columns that can be printed in normal paper, each observation requires two lines.

	NO.	SH_P1	GC_P1	YT_P1	YC_P1	GI_P1	GO_P1	TI_P1	TO_P1
TOTAL	SH_P2	GC_P2	YT_P2	YC_P2	GI_P2	GO_P2	TI_P2	TO_P2	TOTAL
	1	9.6	81.4	55.6	24.2	8.2	77.8	0.1	0.0
256.8	9.6	82.2	56.3	22.6	0.0	0.0	0.0	0.0	170.7
	2	9.4	76.5	43.8	38.7	7.9	47.7	0.0	0.0
224.0	9.4	77.6	42.3	39.7	8.2	46.3	0.0	0.0	223.5
	3	9.4	78.4	55.2	36.1	8.1	48.1	0.0	0.0
235.3	9.4	80.1	50.3	33.6	8.2	48.2	0.0	0.0	229.8
	4	11.7	82.9	57.8	37.2	8.1	49.5	0.0	0.0
247.2	11.7	82.9	51.3	34.7	8.1	46.7	0.0	0.0	235.5
	5	9.4	78.1	48.1	36.2	8.1	47.5	0.0	0.0
227.4	9.4	79.6	49.5	34.4	8.2	47.6	0.0	0.0	228.7

REFERENCES

PRC93.- PRC, Inc., "Assessment of Cargo Handling Technology", Vol. I and II, report no. MA-RD-840-93004, written for the Maritime Administration, 1993.