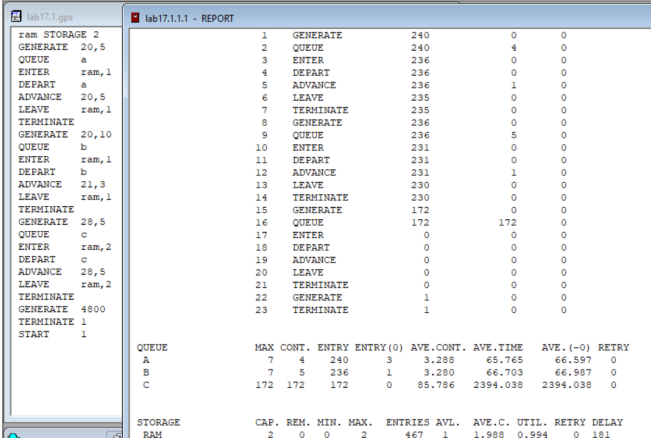


Лабораторная работа № 17

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Выполнить задания по моделированию вычислительного центра, аэропорта и морского порта.

17.1 Построил модель ЭВМ и запустил симуляцию: (рис. @fig:001):



The screenshot displays a simulation environment with two main windows. The left window, titled 'lab17.1.gsn', contains a GSN (General System Network) model. The right window, titled 'lab17.1.1 - REPORT', shows the execution results.

lab17.1.gsn

```
ram STORAGE 2
GENERATE 20,5
QUEUE a
ENTER ram,1
DEPART a
ADVANCE 20,5
LEAVE ram,1
TERMINATE
GENERATE 20,10
QUEUE b
ENTER ram,1
DEPART b
ADVANCE 21,3
LEAVE ram,1
TERMINATE
GENERATE 28,5
QUEUE c
ENTER ram,2
DEPART c
ADVANCE 28,5
LEAVE ram,2
TERMINATE
GENERATE 4800
TERMINATE 1
START 1
```

lab17.1.1 - REPORT

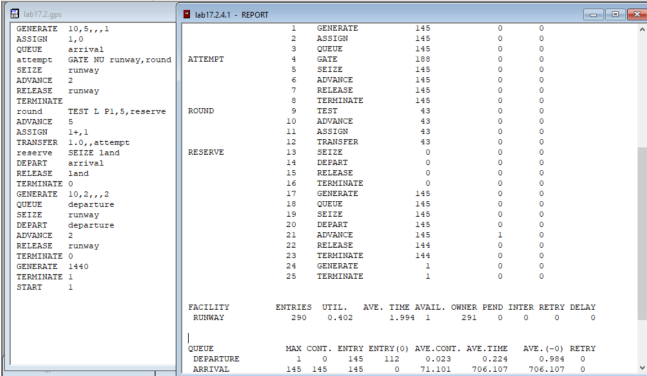
1	GENERATE	240	0	0				
2	QUEUE	240	4	0				
3	ENTER	236	0	0				
4	DEPART	236	0	0				
5	ADVANCE	236	1	0				
6	LEAVE	235	0	0				
7	TERMINATE	235	0	0				
8	GENERATE	236	0	0				
9	QUEUE	236	5	0				
10	ENTER	231	0	0				
11	DEPART	231	0	0				
12	ADVANCE	231	1	0				
13	LEAVE	230	0	0				
14	TERMINATE	230	0	0				
15	GENERATE	172	0	0				
16	QUEUE	172	172	0				
17	ENTER	0	0	0				
18	DEPART	0	0	0				
19	ADVANCE	0	0	0				
20	LEAVE	0	0	0				
21	TERMINATE	0	0	0				
22	GENERATE	1	0	0				
23	TERMINATE	1	0	0				

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
A	7	4	240	3	3.288	65.765	66.597	0
B	7	5	236	1	3.280	66.703	66.987	0
C	172	172	172	0	85.786	2394.038	2394.038	0

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
RAM	2	0	0	2	467	1	1.988	0.994	0	181

Рис. 1: модель1

17.2 Построил модель аэропорта и запустил симуляцию: (рис. @fig:002)



The screenshot shows a simulation software window with two panes. The left pane, titled 'lab17.2.gps', contains a GASP model script. The right pane, titled 'lab17.2.4.1 - REPORT', displays the simulation results in a table format.

Model Script (lab17.2.gps):

```
GENERATE 10,5,,,1
ASSIGN 1,0
QUEUE arrival
attempt GATE NU runway,round
SEIZE runway
ADVANCE 2
RELEASE runway
TERMINATE
round TEST L P1,5,reserve
ADVANCE 5
ASSIGN 1+,1
TRANSFER 1,0,attempt
reserve SEIZE land
DEPART arrival
RELEASE land
TERMINATE 0
GENERATE 10,2,,,2
QUEUE departure
SEIZE runway
DEPART departure
ADVANCE 2
RELEASE runway
TERMINATE 0
GENERATE 1440
TERMINATE 1
START 1
```

Simulation Report (lab17.2.4.1 - REPORT):

	1	GENERATE	145	0	0
	2	ASSIGN	145	0	0
	3	QUEUE	145	0	0
ATTEMPT	4	GATE	188	0	0
	5	SEIZE	145	0	0
	6	ADVANCE	145	0	0
	7	RELEASE	145	0	0
	8	TERMINATE	145	0	0
ROUND	9	TEST	43	0	0
	10	ADVANCE	43	0	0
	11	ASSIGN	43	0	0
	12	TRANSFER	43	0	0
RESERVE	13	SEIZE	0	0	0
	14	DEPART	0	0	0
	15	RELEASE	0	0	0
	16	TERMINATE	0	0	0
	17	GENERATE	145	0	0
	18	QUEUE	145	0	0
	19	SEIZE	145	0	0
	20	DEPART	145	0	0
	21	ADVANCE	145	1	0
	22	RELEASE	144	0	0
	23	TERMINATE	144	0	0
	24	GENERATE	1	0	0
	25	TERMINATE	1	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
RUNWAY	290	0.402	1.994	1	291	0	0	0	0

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
DEPARTURE	1	0	145	112	0.023	0.224	0.984	0
ARRIVAL	145	145	145	0	71.101	706.107	706.107	0

Рис. 2: модель2

17.3 1) Построил модель морского порта и запустил симуляцию: (рис. @fig:003)

lab17.3.1.gps		lab17.3.1.1 - REPORT					
port STORAGE 10 GENERATE 20,5 QUEUE ships ENTER port,3 DEPART ships ADVANCE 10,3 LEAVE port,3 TERMINATE 0 GENERATE 24 TERMINATE 1 START 180		START TIME END TIME BLOCKS FACILITIES STORAGES 0.000 4320.000 9 0 1					
		NAME VALUE PORT 10000.000 SHIPS 10001.000					
		LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY					
		1 GENERATE 215 0 0					
		2 QUEUE 215 0 0					
		3 ENTER 215 0 0					
		4 DEPART 215 0 0					
		5 ADVANCE 215 1 0					
		6 LEAVE 214 0 0					
		7 TERMINATE 214 0 0					
		8 GENERATE 180 0 0					
		9 TERMINATE 180 0 0					
		QUEUE MAX CONT. ENTRY ENTRY (0) AVE. CONT. AVE. TIME AVE. (-0) RETRY					
		SHIPS 1 0 215 215 0.000 0.000 0.000 0					
		STORAGE CAP. REM. MIN. MAX. ENTRIES AVL. AVE.C. UTIL. RETRY DELAY					
		PORT 10 7 0 3 645 1 1.485 0.148 0 0					
		FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE					
		395 0 4324.260 395 5 6					
		396 0 4335.233 396 0 1					
		397 0 4344.000 397 0 8					

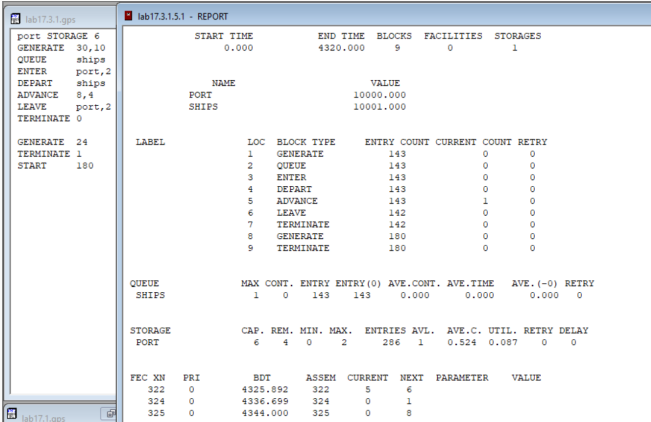
Рис. 3: модель3.1

Данные для 9, 6 и 3 причалов соответственно: (рис. @fig:004)

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	9	6	0	3	645	1	1.485	0.165	0	0
STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	6	3	0	3	645	1	1.485	0.247	0	0
STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	3	0	0	3	645	1	1.485	0.495	0	0

Рис. 4: загрузка причалов

17.3 2) Построил модель морского порта и запустил симуляцию: (рис. @fig:005)



lab17.3.1.gps

```
port STORAGE 6
GENERATE 30,10
QUEUE ships
ENTER port,2
DEPART ships
ADVANCE 8,4
LEAVE port,2
TERMINATE 0

GENERATE 24
TERMINATE 1
START 180
```

lab17.3.1.5.1 - REPORT

START TIME	END TIME	BLOCKS	FACILITIES	STORAGES
0.000	4320.000	9	0	1

NAME	VALUE
PORT	10000.000
SHIPS	10001.000

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
1	GENERATE	143	0	0	
2	QUEUE	143	0	0	
3	ENTER	143	0	0	
4	DEPART	143	0	0	
5	ADVANCE	143	1	0	
6	LEAVE	142	0	0	
7	TERMINATE	142	0	0	
8	GENERATE	180	0	0	
9	TERMINATE	180	0	0	

QUEUE	MAX CONT.	ENTRY	ENTRY (0)	AVE. CONT.	AVE. TIME	AVE. (-0)	RETRY
SHIPS	1	0	143	143	0.000	0.000	0

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	6	4	0	2	286	1	0.524	0.087	0	0

FEC	XN	PRI	BDT	ASSEM	CURRENT	NEXT	PARAMETER	VALUE
322	0		4325.892	322	5	6		
324	0		4336.699	324	0	1		
325	0		4344.000	325	0	8		

lab17.1.gps

Рис. 5: модель3.2

Данные для 4 и 2 причалов: (рис. @fig:006)

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	4	2	0	2	286	1	0.524	0.131	0	0
STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
PORT	2	0	0	2	286	1	0.524	0.262	0	0

Рис. 6: загрузка причалов

Выполнил поставленные задачи, используя GPSS.