Лабораторная работа 14

Модели обработки заказов

Туем Г.

Российский университет дружбы народов, Москва, Россия



Докладчик

- Туем Гислен
- Студент
- Российский университет дружбы народов
- · 1032225069@pfur.ru



Цель работы



Реализовать модели обработки заказов и провести анализ результатов.

Задание

Задание

Реализовать с помощью gpss:

модель оформления заказов клиентов одним оператором; построение гистограммы распределения заявок в очереди; модель обслуживания двух типов заказов от клиентов в интернет-магазине; модель оформления заказов несколькими операторами.

Выполнение лабораторной работы

Модель оформления заказов клиентов одним оператором

Untitled Model 1.gps

```
;operator
GENERATE 15.4
QUEUE operator q
SEIZE operator
DEPART operator q
ADVANCE 10,2
RELEASE operator
TERMINATE 0
:timer
GENERATE 480
TERMINATE 1
START 1
```

Модель оформления заказов клиентов одним оператором

report Model 1.1.1.gpr					×
START TIME	END TIME	BLOCKS E	PACILITIES	STORAGES	_
0.000	480.000	9	1	0	
NAME		VALUE			
OPERATOR	100	001.000			
OPERATOR Q	100	000.000			
LABEL LOC 1 2 3 4 5 6 6	BLOCK TYPE F GENERATE QUEUE SEIZE DEPART ADVANCE RELEASE	ENTRY COUNT 32 32 32 32 32 32	CURRENT CO	OUNT RETRY 0 0 0 0 0 0 0	
7	TERMINATE	31	0	0	
8	GENERATE	1	0	0	
9	TERMINATE	1	0	0	
FACILITY ENTRIES OPERATOR 32		ME AVAIL.	OWNER PEND 33 0	INTER RETRY 0 0	DELAY 0
QUEUE MAX O	ONT. ENTRY ENTRY 0 32 31				RETRY 0
FEC XN PRI BD 33 0 489 34 0 496 35 0 960	786 33 5 081 34 0	6) 1	PARAMETER	VALUE	

Model 1.gps

;operator GENERATE 3.14,1.7 QUEUE operator q SEIZE operator DEPART operator q ADVANCE 6.66,1.7 RELEASE operator TERMINATE 0 :timer GENERATE 480 TERMINATE 1 START 1

Упражнение

Model 1.2.1 - REPORT					_
START TIME	END TI	ME BLOCKS	FACILITIES	STORAGES	_
0.000	480.0	00 9	1	0	
NAME		VALUE			
OPERATOR		10001.000			
OPERATOR Q		10000.000			
	BLOCK TYPE				
	GENERATE	152	0	0	
	QUEUE	152	82		
	SEIZE	70	0	-	
	DEPART	70	0	0	
	ADVANCE	70	1	0	
_	RELEASE	69	0	0	
	TERMINATE	69	0	•	
	GENERATE	1	0	0	
9	TERMINATE	1	0	0	
	UTIL. AVE.				DELAY 82
QUEUE MAX C OPERATOR_Q 82	ONT. ENTRY ENT				
71 0 480. 154 0 483.	ASSEM C 405 71 330 154 000 155	5 6 0 1	T PARAMETER	VALUE	

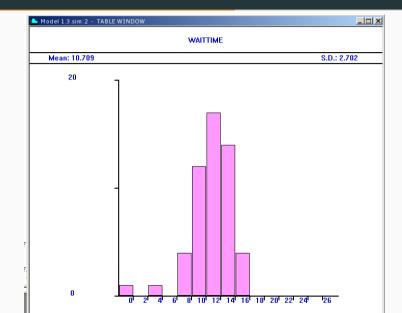
Построение гистограммы распределения заявок в очереди

```
Waittime QTABLE operator q,0,2,15
GENERATE 3.34,1.7
TEST LE Q$operator q,1,Fin
SAVEVALUE Custnum+,1
ASSIGN Custnum, X$Custnum
QUEUE operator q
SEIZE operator
DEPART operator q
ADVANCE 6.66,1.7
RELEASE operator
Fin TERMINATE 1
```

Построение гистограммы распределения заявок в очереди

START TIME	File Edit Search Yiew Comma	and Window Help	
NAME		[94]	
COSTUMN 10003.000			
1	CUSTNUM FIN OPERATOR OPERATOR_Q	10002.000 10.000 10003.000 10001.000	
OPERATOR 54 0.987 6.470 1 98 0 0 0 1 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR_O 2 2 88 1 1.652 10.638 10.824 0 TABLE MEAN SID.DEV. PAMOE RETRY FREQUENCY CUM. * 0 0.00 - 0.000 1 1.89 1.000 - 0.000 1 1.89 1.000 - 0.000 1 1.89 1.000 - 0.000 1 1.89 1.000 - 0.000 1 1.89 1.000 - 1.000 1 1.333,96 1.000 - 11.000 1 12.33,96 1.000 - 11.000 1 14.92.45 1.000 - 11.000 1 14.92.45	1 2 3 4 5 6 7 8 9	GRHERATE 102 0 0 TEST 102 0 0 SAVEYALUE 55 0 0 AASTON 65 0 0 0 COUNCE 55 1 0 COU	
TABLE MEAN SID.BEV. PANGE 0 TETRY PREQUENCY CUM. ** NANITIME 10.709 2.702 - 0.000 1 1.89 2.000 - 2.000 0 1 1.89 2.000 - 4.000 1 3.77 4.000 - 6.000 0 3.77 6.000 - 8.000 0 1.3 33.96 6.000 - 10.000 12 33.96 10.000 - 11.000 12 33.96 11.000 - 14.000 14 \$2.45 11.000 - 14.000 14 \$2.45 11.000 - 16.000 0 10 \$2.000 SAVEVALUE RETRY VALUE			
- 0.000 1 1.89 0.007 - 2.000 0 1 1.89 0.007 - 2.000 0 1 1.87 1.000 - 4.000 0 1 1 3.77 4.000 - 4.000 0 1 3.77 4.000 - 10.000 1 3.77 4.000 - 10.000 1 2 33.96 10.000 - 12.000 17 66.0 12.000 - 14.000 14 52.45 14.000 - 16.000 4 100.00	QUEUE MAX CO	ONI. ENTRY ENTRY(0) AVE.CONI. AVE.TIME AVE.(-0) RETRY 2 55 1 1.652 10.628 10.824 0	
		2.702 0 1 1.89 0.007 - 0.000 0 1 1.89 4.000 - 2.000 0 0 1.89 4.000 - 4.000 0 3.77 6.000 - 8.000 4 11.32 8.000 - 10.000 12 33.96 10.000 - 12.000 17 66.04 12.000 - 14.000 14 82.48 14.000 - 14.000 14 82.48	
CEC XN PRI M1 ASSEM CURRENT NEXT PARAMETER VALUE	CUSTNUM	0 55.000	

Построение гистограммы распределения заявок в очереди



Модель обслуживания двух типов заказов от клиентов в интернет-магазине

```
Model 1.gps
 : order
GENERATE 15.4
QUEUE operator q
SEIZE operator
DEPART operator q
ADVANCE 10,2
RELEASE operator
TERMINATE 0
 ; order and service package
GENERATE 30,8
QUEUE operator q
SEIZE operator
DEPART operator q
ADVANCE 5,2
ADVANCE 10.2
RELEASE operator
TERMINATE 0
 :timer
GENERATE 480
TERMINATE 1
START 1
```

Модель обслуживания двух типов заказов от клиентов в интернет-магазине

Model 1.4.	1 - REPORT		
	суббо	ота, мая 10, 2025 23:25:23	
		END TIME BLOCKS FACILITIES STORAGES	
	0.000	480.000 17 1 0	
	NAME	VALUE	
	NAME OPERATOR OPERATOR_Q	10001.000	
	OPERATOR O	1 10000.000	
	OFERRIOR_Q	10000.000	
LABEL		BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY	
	1	GENERATE 32 0 0 OUEUE 32 4 0	
		QUEUE 32 4 0 SEIZE 28 0 0	
	4	DEPART 28 0 0	
		ADVANCE 28 1 0	
		TERMINATE 27 0 0	
		GENERATE 15 0 0	
		QUEUE 15 3 0	
		SETTE 12 0 0	
	11	DEPART 12 0 0 ADVANCE 12 0 0 ADVANCE 12 0 0	
		ADVANCE 12 0 0	
	13	ADVANCE 12 0 0	
	14	RELEASE 12 0 0	
	15	TERMINATE 12 0 0	
	16	GENERATE 1 0 0	
	17	TERMINATE 1 0 0	
FACTLITY	PNTDIFO	UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY	DELAY
OPERATOR		0.947 11.365 1 42 0 0 0	
OFERATOR	. 10	0.91/ 11.000 1 12 0 0 0	,
aunun			D. D. D. D. L.
QUEUE	MAX C	CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) 7 47 2 3.355 34.261 35.784	RETRY
OPERATOR	_u 8	/ 4/ 2 3.355 34.261 35.784	U
ini			
FEC XN		I ASSEM CURRENT NEXT PARAMETER VALUE .825 42 5 6	
42	0 487.	.020 42 0 0	

🤼 Model 1.gps

```
: order
GENERATE 15,4
QUEUE operator q
SEIZE operator
DEPART operator q
ADVANCE 10,2
TRANSFER 0.3, noextra, extra
extra ADVANCE 5,2
noextra RELEASE operator
TERMINATE 0
:timer
GENERATE 480
TERMINATE 1
START 1
```

Упражнение

NAME EXTRA 7.000 NOEXTRA 8.000 OPERATOR 10001.000 OPERATOR 10001.000 OPERATOR 10001.000 LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY 1 GENERATE 33 0 0 0 2 QUEUE 33 0 0 0 3 SEIZE 33 0 0 0 4 DEPART 33 0 0 0 6 TRANSFER 33 0 0 0 EXTRA 7 ADVANCE 33 0 0 0 EXTRA 7 ADVANCE 8 1 0 0 EXTRA 7 ADVANCE 8 1 0 0 OEXTRA 8 RELEASE 32 0 0 0 OEXTRA 8 RELEASE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY (0) AVE.CONT. AVE.TIME AVE. (-0) RETRY OPERATOR 0 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1 36 0 960.000 36 0 10	Model 1.6.1 - REPORT		_ X
NOEXTRA	NAME	VALUE	_
OPERATOR 0 10001.000 LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY 1 GENERATE 33 0 0 2 QUEUE 33 0 0 3 SEIZE 33 0 0 4 DEPART 33 0 0 5 ADVANCE 33 0 0 6 TRANSFER 33 0 0 EXTRA 7 ADVANCE 8 1 0 NOEXTRA 8 RELEASE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 32 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	EXTRA	7.000	
OPERATOR_Q 10000.000 LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY 1 GENERATE 33 0 0 0 2 QUEUE 33 0 0 0 3 SEIZE 33 0 0 0 4 DEPART 33 0 0 0 5 ADVANCE 33 0 0 0 6 TRANSFER 33 0 0 0 EXTRA 7 ADVANCE 8 1 0 0 EXTRA 7 ADVANCE 8 1 0 0 EXTRA 8 RELEASE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	NOEXTRA	8.000	
LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY 1 GENERATE 33 0 0 2 QUEUE 33 0 0 0 3 SEIZE 33 0 0 0 4 DEPART 33 0 0 0 5 ADVANCE 33 0 0 0 6 TRANSFER 33 0 0 0 6 TRANSFER 33 0 0 0 EXTRA 7 ADVANCE 8 1 0 NOEXTRA 8 RELEASE 32 0 0 0 9 TERMINATE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	OPERATOR	10001.000	
LABEL LOC BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY 1 GENERATE 33 0 0 2 QUEUE 33 0 0 0 3 SEIZE 33 0 0 0 4 DEPART 33 0 0 0 5 ADVANCE 33 0 0 0 6 TRANSFER 33 0 0 0 6 TRANSFER 33 0 0 0 EXTRA 7 ADVANCE 8 1 0 NOEXTRA 8 RELEASE 32 0 0 0 9 TERMINATE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	OPERATOR Q	10000.000	
1 GENERATE 33 0 0 0			
2 QUEUE 33 0 0 0	LABEL LOC	BLOCK TYPE ENTRY COUNT CURRENT COUNT RETRY	
3 SEIZE 33 0 0 0			
4 DEPART 33 0 0 0 0	2	QUEUE 33 0 0	
S ADVANCE 33 0 0	3	SEIZE 33 0 0	
CALCAR C	4	DEPART 33 0 0	
EXTRA 7 ADVANCE 8 1 0 NOEXTRA 8 RELEASE 32 0 0 9 TERMINATE 32 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	5	ADVANCE 33 0 0	
EXTRA 7 ADVANCE 8 1 0 NOEXTRA 8 RELEASE 32 0 0 0 9 TERMINATE 32 0 0 0 10 GENERATE 1 0 0 0 11 TERMINATE 1 0 0 0 FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR_0 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	6		
NOEXTRA	EXTRA 7	ADVANCE 8 1 0	
10 GENERATE 1 0 0	NOEXTRA 8	RELEASE 32 0 0	
TACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY (0) AVE.CONT. AVE.TIME AVE. (-0) RETRY OPERATOR_Q 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	9	TERMINATE 32 0 0	
FACILITY ENTRIES UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY OPERATOR 33 0.766 11.146 1 34 0 0 0 0 0 QUEUE MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RETRY OPERATOR_Q 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	10	GENERATE 1 0 0	
OPERATOR 33 0.766 11.146 1 34 0 0 0 0 0 QUEUE	11	TERMINATE 1 0 0	
OPERATOR 33 0.766 11.146 1 34 0 0 0 0 0 QUEUE			
OPERATOR 33 0.766 11.146 1 34 0 0 0 0 0 QUEUE	FACILITY ENTRIES	UTIL. AVE. TIME AVAIL. OWNER PEND INTER RETRY DE	LAY
OPERATOR_Q 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	OPERATOR 33		
OPERATOR_Q 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1			
OPERATOR_Q 1 0 33 25 0.054 0.781 3.220 0 FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	OUEUE MAX C	ONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME AVE.(-0) RE	TRY
FEC XN PRI BDT ASSEM CURRENT NEXT PARAMETER VALUE 34 0 482.925 34 7 8 35 0 487.726 35 0 1	OPERATOR O 1	0 33 25 0.054 0.781 3.220	0
34 0 482.925 34 7 8 35 0 487.726 35 0 1			
34 0 482.925 34 7 8 35 0 487.726 35 0 1	FFC XN PRT BOT	ASSEM CURRENT NEXT PARAMETER VALUE	
35 0 487.726 35 0 1			
25 0 050 000 25 0 10	35 0 487.		
	36 0 960.	000 36 0 10	

operator STORAGE 4 GENERATE 5,2 QUEUE operator q ENTER operator,1 DEPART operator q ADVANCE 10,2 LEAVE operator,1 TERMINATE 0 ; timer GENERATE 480 TERMINATE 1 START 1

Модель оформления заказов несколькими операторами

	START I							ACILITIES				
	0.	000		4	80.000	9	9	0		1		
	NAME					VALUE	0					
OPERATOR				10000.000								
	OPERATOR	1_Q			10	001.00	00					
LABEL		LOC	BLO	CK TYP	E	ENTRY	COUNT	CURRENT	COUNT	RETRY		
		1	GEN	ERATE		9	93		0	0		
		2	QUE	JE		9	93		0	0		
		3	ENT	ER		9	93		0	0		
		4	DEP	ART		93			0	0		
		5	ADV	ANCE		9	93		2	0		
		6	LEA	VE		9	91		0	0		
		7	TER	MINATE		9			0	0		
		8	GEN	ERATE			1		0	0		
		9	TER	MINATE			1		0	0		
QUEUE		MAX	CONT.	ENTRY	ENTRY	(O) AT	VE.CON	I. AVE.TI	ME I	AVE.(-0)	RETRY	
OPERATOR_	Q	1	0	93	9	3	0.000	0.0	000	0.000	0	
STORAGE		CAP.	REM.	MIN.	MAX.	ENTRIE	ES AVL	. AVE.C.	UTIL	. RETRY	DELAY	
OPERATOR			2			93					0	

Рис. 13: Отчёт по модели оформления заказов в интернет-магазине

🥌 Model 1.gps

```
operator STORAGE 4
GENERATE 5,2
TEST LE Q$operator q,2
QUEUE operator q
ENTER operator, 1
DEPART operator q
ADVANCE 30,2
LEAVE operator, 1
TERMINATE O
:timer
GENERATE 480
TERMINATE 1
```

Упражнение

ST	ART TIME		EN	D TIME	BLO	CKS F	ACILITIE:				
	0.000		4	80.000		9	0		1		
	NAME				VALU	E					
OPERATOR			10000.000								
OPE	RATOR_Q			10	001.0	00					
LABEL	LOG	C BLO	CK TYP	E	ENTRY	COUNT	CURRENT	COUNT	RETRY		
	1	GEN	ERATE			93		0	0		
	2	QUE	UE			93		0	0		
	3	ENT	ER		93				0		
	4	DEPART			93			0	0		
	5	ADVANCE LEAVE						2	0		
	6							0	0		
	7	TER	MINATE			91		0	0		
	8	GEN	ERATE			1		0	0		
	9	TER	MINATE			1		0	0		
QUEUE	MAX	CONT.	ENTRY	ENTRY	(0) A	VE.CON	T. AVE.T	IME	AVE. (-0)	RETRY	
OPERATOR_Q		0							0.000		
STORAGE	CAP	REM.	MIN.	MAX.	ENTRI	ES AVL	. AVE.C	. UTIL	. RETRY	DELAY	
OPERATOR	4	2	0	4	9:	3 1	1.926	0.48	2 0	0	

Рис. 15: Отчёт по модели оформления заказов в интернет-магазине

Выводы

Выводы

В результате был реализован с помощью gpss:

модель оформления заказов клиентов одним оператором; построение гистограммы распределения заявок в очереди; модель обслуживания двух типов заказов от клиентов в интернет-магазине; модель оформления заказов несколькими операторами.