Презентация по лабораторной работе №14

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Постановка задачи

Построить несколько моделей обработки заказов и гистограмму распределения заявок в очереди.

Модель оформления заказов клиентов одним оператором

```
;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
```

START TIME	END TIME	BLOCKS	FACILITIES	STORAGES
0.000	480.000	9	1	0

NAME	VALUE
OPERATOR	10001.000
OPERATOR_Q	10000.000

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
	1	GENERATE	32	0	0
	2	QUEUE	32	0	0
	3	SEIZE	32	0	0
	4	DEPART	32	0	0
	5	ADVANCE	32	1	0
	6	RELEASE	31	0	0
	7	TERMINATE	31	0	0
	8	GENERATE	1	0	0
	9	TERMINATE	1	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
OPERATOR	32	0.639	9.589	1	33	0	0	0	0

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
OPERATOR_Q	1	0	32	31	0.001	0.021	0.671	0

FEC XN	PRI	BDT	ASSEM	CURRENT	NEXT	PARAMETER	VALUE
33	0	489.786	33	5	6		
34	0	496.081	34	0	1		
35	0	960.000	35	0	8		

Построение скорректированной модели

```
              START TIME          END TIME  BLOCKS  FACILITIES  STORAGES
                 0.000             480.000     9         1          0


              NAME                    VALUE
          OPERATOR                  10001.000
          OPERATOR_Q                10000.000


LABEL              LOC  BLOCK TYPE      ENTRY COUNT  CURRENT COUNT  RETRY
                    1   GENERATE           152            0          0
                    2   QUEUE              152           82          0
                    3   SEIZE               70            0          0
                    4   DEPART              70            0          0
                    5   ADVANCE             70            1          0
                    6   RELEASE             69            0          0
                    7   TERMINATE           69            0          0
                    8   GENERATE             1            0          0
                    9   TERMINATE            1            0          0


FACILITY        ENTRIES   UTIL.    AVE. TIME  AVAIL. OWNER PEND INTER RETRY DELAY
  OPERATOR         70     0.991     6.796   1       71    0    0     0    82


QUEUE            MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME   AVE.(-0) RETRY
  OPERATOR_Q      82   82    152      1     39.096   123.461   124.279    0


FEC XN   PRI      BDT      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
    71    0     480.405      71      5       6
   154    0     483.330     154      0       1
   155    0     960.000     155      0       8
```

```
;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
```

Untitled Model 1

```
Waittime QTABLE operator_q,
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
```

Untitled Model 1.3.1 - REPORT

```
            GPSS World Simulation Report - Untitled Model 1.3.1

                    суббота, июня 10, 2023 13:26:03

        START TIME          END TIME  BLOCKS  FACILITIES  STORAGES
          0.000             353.895     10         1          0


              NAME                  VALUE
        CUSTNUM               10002.000
        FIN                      10.000
        OPERATOR              10003.000
        OPERATOR_Q            10001.000
        WAITTIME             10000.000
```

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
	1	GENERATE	102	0	0
	2	TEST	102	0	0
	3	SAVEVALUE	55	0	0
	4	ASSIGN	55	0	0
	5	QUEUE	55	1	0
	6	SEIZE	54	1	0
	7	DEPART	53	0	0
	8	ADVANCE	53	0	0
	9	RELEASE	53	0	0
FIN	10	TERMINATE	100	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
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_Q	2	2	55	1	1.652	10.628	10.824	0

TABLE	MEAN	STD.DEV.	RANGE	RETRY	FREQUENCY	CUM.%
WAITTIME	10.709	2.702		0		
			_ - 0.000		1	1.89
			0.000 - 2.000		0	1.89
			2.000 - 4.000		1	3.77

Untitled Model 1.3.1 - REPORT

```
        OPERATOR_Q           10001.000
        WAITTIME             10000.000
```

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
	1	GENERATE	102	0	0
	2	TEST	102	0	0
	3	SAVEVALUE	55	0	0
	4	ASSIGN	55	0	0
	5	QUEUE	55	1	0
	6	SEIZE	54	1	0
	7	DEPART	53	0	0
	8	ADVANCE	53	0	0
	9	RELEASE	53	0	0
FIN	10	TERMINATE	100	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
OPERATOR	54	0.987	6.470	1	98	0	0	1

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
OPERATOR_Q	2	2	55	1	1.652	10.628	10.824	0

TABLE	MEAN	STD.DEV.	RANGE	RETRY	FREQUENCY	CUM.%
WAITTIME	10.709	2.702			0	
			_ - 0.000		1	1.89
			0.000 - 2.000		0	1.89
			2.000 - 4.000		1	3.77
			4.000 - 6.000		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	92.45
			14.000 - 16.000		4	100.00

SAVEVALUE	RETRY	VALUE
CUSTNUM	0	55.000

Построение гистограммы распределения заявок в очереди

Гистограмма

WAITTIME

Mean: 10.709   S.D.: 2.702
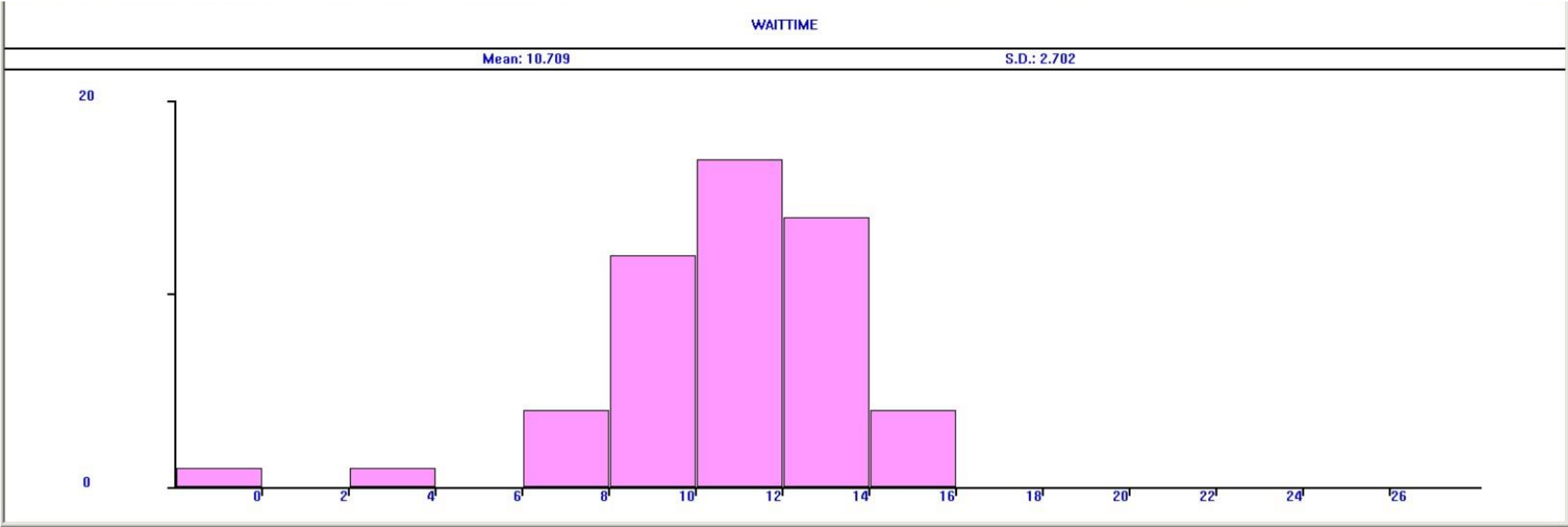
Модель обслуживания двух типов заказов от клиентов

```
; 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 TIME        END TIME  BLOCKS  FACILITIES  STORAGES
          0.000            480.000    17         1          0

          NAME                  VALUE
        OPERATOR             10001.000
        OPERATOR_Q           10000.000

LABEL           LOC  BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                 1   GENERATE           32          0         0
                 2   QUEUE              32          4         0
                 3   SEIZE              28          0         0
                 4   DEPART             28          0         0
                 5   ADVANCE            28          1         0
                 6   RELEASE            27          0         0
                 7   TERMINATE          27          0         0
                 8   GENERATE           15          0         0
                 9   QUEUE              15          3         0
                10   SEIZE              12          0         0
                11   DEPART             12          0         0
                12   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

FACILITY      ENTRIES  UTIL.   AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY
  OPERATOR      40     0.947    11.365    1       42    0    0    0     7

QUEUE            MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME  AVE.(-0) RETRY
  OPERATOR_Q       8      7     47      2      3.355   34.261   35.784   0

FEC XN  PRI       BDT      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
    42   0      487.825     42      5       6
    50   0      493.164     50      0       1
    49   0      499.562     49      0       8
    51   0      960.000     51      0      16
```

Построение скорректированной модели

```
              COMPLEX                          7.000
              OPERATOR                     10001.000
              OPERATOR_Q                   10000.000
              SIMPLE                           8.000

   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
   COMPLEX          7    ADVANCE              8          1          0
   SIMPLE           8    RELEASE             32          0          0
                    9    TERMINATE           32          0          0
                   10    GENERATE             1          0          0
                   11    TERMINATE            1          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_Q        1    0    33     25      0.054     0.781      3.220   0
```
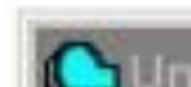
```
QUEUE operator_q
SEIZE operator
DEPART operator_q
ADVANCE 10,2
TRANSFER 0.3 simple, complex
complex ADVANCE 5,2
simple RELEASE operator
TERMINATE 0

;timer
GENERATE 480
```

Модель оформления заказов несколькими операторами

```
                NAME                    VALUE
        OPERATOR                    10000.000
        OPERATOR_Q                  10001.000


LABEL           LOC   BLOCK TYPE      ENTRY COUNT  CURRENT COUNT  RETRY
                1     GENERATE            93             0          0
                2     QUEUE               93             0          0
                3     ENTER               93             0          0
                4     DEPART              93             0          0
                5     ADVANCE             93             2          0
                6     LEAVE               91             0          0
                7     TERMINATE           91             0          0
                8     GENERATE             1             0          0
                9     TERMINATE            1             0          0


QUEUE           MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME   AVE.(-0) RETRY
  OPERATOR_Q      1     0    93      93     0.000     0.000      0.000    0


STORAGE         CAP. REM. MIN. MAX.   ENTRIES AVL.  AVE.C. UTIL. RETRY DELAY
  OPERATOR        4    2    0    4       93    1     1.926  0.482   0     0


FEC XN    PRI       BDT      ASSEM  CURRENT  NEXT  PARAMETER   VALUE
    95     0     480.457      95      0        1
    93     0     482.805      93      5        6
    94     0     483.473      94      5        6
```

```
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
```

Построение скорректированной модели

```
        NAME                      VALUE
        OPERATOR                  10000.000
        OPERATOR_Q                10001.000


LABEL              LOC  BLOCK TYPE       ENTRY COUNT  CURRENT COUNT  RETRY
                   1    GENERATE              93              0        0
                   2    TEST                  93              0        0
                   3    QUEUE                 93              0        0
                   4    ENTER                 93              0        0
                   5    DEPART                93              0        0
                   6    ADVANCE               93              2        0
                   7    LEAVE                 91              0        0
                   8    TERMINATE             91              0        0
                   9    GENERATE               1              0        0
                   10   TERMINATE              1              0        0


QUEUE              MAX CONT.  ENTRY  ENTRY(0)  AVE.CONT.  AVE.TIME   AVE.(-0)  RETRY
  OPERATOR_Q         1    0     93       93      0.000      0.000      0.000     0


STORAGE            CAP. REM. MIN. MAX.  ENTRIES AVL.  AVE.C. UTIL. RETRY DELAY
  OPERATOR           4    2   0    4       93    1    1.926  0.482    0     0


FEC XN    PRI       BDT     ASSEM  CURRENT  NEXT  PARAMETER   VALUE
    95     0      480.457     95      0       1
    93     0      482.805     93      6       7
```

```
operator STORAGE 4
GENERATE 5,2
TEST LE Q$operator_q,2
QUEUE operator_q
ENTER operator,1
DEPART operator_q
ADVANCE 10,2
LEAVE operator
TERMINATE 0

;timer
GENERATE 480
TERMINATE 1
```

Внесение изменений в модель

```
                                                      10000.000
OPERATOR_Q                                            10001.000

LABEL              LOC  BLOCK TYPE      ENTRY COUNT CURRENT COUNT RETRY
                   1    GENERATE            94          27         0
                   2    TEST                67           0         0
                   3    QUEUE               67           3         0
                   4    ENTER               64           0         0
                   5    DEPART              64           0         0
                   6    ADVANCE             64           4         0
                   7    LEAVE               60           0         0
                   8    TERMINATE           60           0         0
                   9    GENERATE             1           0         0
                   10   TERMINATE            1           0         0


QUEUE              MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME  AVE.(-0) RETRY
 OPERATOR_Q         3    3     67      4      2.701    19.347    20.576   27


STORAGE            CAP. REM. MIN. MAX.  ENTRIES AVL.  AVE.C. UTIL. RETRY DELAY
 OPERATOR           4    0    0    4      64     1    3.885  0.971    0     3


FEC XN    PRI        BDT      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
    96     0       480.736     96       0      1
    62     0       491.784     62       6      7
```

Untitled Model 1

```
operator STORAGE 4
GENERATE 5,2
TEST LE Q$operator_q,2
QUEUE operator_q
ENTER operator
DEPART operator_q
ADVANCE 30,2
LEAVE operator
TERMINATE 0

;timer
GENERATE 480
TERMINATE 1
START 1
```