Моделирование простейших СМО с очередями

1. Модель1: изменить задание из практической работы №2 добавив очереди к устройствам К1-К5. С равномерным распределением между устройствами. И без удаления на 5 устройстве. Обработать 500 транзактов и в течении 8 часов.

500 транзактов:

K2 STORAGE 2

K4 STORAGE 3

K5 STORAGE 4

GENERATE 7,5

TRANSFER .5,METKA1,METKA2

METKA1 QUEUE SER

SEIZE K1

DEPART SER

ADVANCE 45,5

RELEASE K1

TRANSFER,OUTMETKA1

METKA2 QUEUE SER1

ENTER K2

DEPART SER1

ADVANCE 30,7

LEAVE K2

OUTMETKA1 TRANSFER .5,METKA3,METKA4

```
METKA3 QUEUE SER2
       SEIZE K3
       DEPART SER2
       ADVANCE 30,7
       RELEASE K3
       TRANSFER,OUTMETKA3


METKA4 QUEUE SER3
       ENTER K4
       DEPART SER3
       ADVANCE 20,3
       LEAVE K4


OUTMETKA3 GATE SNF K5,VIXOD
       QUEUE SER4
       ENTER K5
       DEPART SER4
       ADVANCE 10,3
       LEAVE K5


VIXOD TERMINATE 1
       START 500
```

Результат работы программы:

```
              START TIME              END TIME  BLOCKS  FACILITIES  STORAGES
                 0.000              6324.931     32         2          3


                  NAME                        VALUE
              K1                          10005.000
              K2                          10000.000
              K3                          10009.000
              K4                          10001.000
              K5                          10002.000
              METKA1                          3.000
              METKA2                          9.000
              METKA3                         15.000
              METKA4                         21.000
              OUTMETKA1                      14.000
              OUTMETKA3                      26.000
              SER                         10004.000
              SER1                        10003.000
              SER2                        10008.000
              SER3                        10006.000
              SER4                        10007.000
              VIXOD                          32.000


  LABEL                LOC   BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                        1    GENERATE           911            0        0
                        2    TRANSFER           911            0        0
  METKA1                3    QUEUE              478          339        0
                        4    SEIZE              139            0        0
                        5    DEPART             139            0        0
                        6    ADVANCE            139            1        0
                        7    RELEASE            138            0        0
                        8    TRANSFER           138            0        0
  METKA2                9    QUEUE              433           17        0
                       10    ENTER              416            0        0
                       11    DEPART             416            0        0
                       12    ADVANCE            416            2        0
                       13    LEAVE              414            0        0
  OUTMETKA1            14    TRANSFER           552            0        0
  METKA3               15    QUEUE              258           49        0
                       16    SEIZE              209            0        0
                       17    DEPART             209            0        0
                       18    ADVANCE            209            1        0
                       19    RELEASE            208            0        0
                       20    TRANSFER           208            0        0
  METKA4               21    QUEUE              294            0        0
                       22    ENTER              294            0        0
                       23    DEPART             294            0        0
                       24    ADVANCE            294            2        0
                       25    LEAVE              292            0        0
  OUTMETKA3            26    GATE               500            0        0
                       27    QUEUE              500            0        0
                       28    ENTER              500            0        0
                       29    DEPART             500            0        0
                       30    ADVANCE            500            0        0
                       31    LEAVE              500            0        0
  VIXOD               32    TERMINATE          500            0        0


  FACILITY          ENTRIES    UTIL.    AVE. TIME AVAIL.  OWNER PEND  INTER RETRY DELAY
   K1                 139      0.997      45.358    1       272    0      0     0    339
   K3                 209      0.984      29.770    1       696    0      0     0     49


  QUEUE             MAX CONT.  ENTRY ENTRY(0)  AVE.CONT.  AVE.TIME    AVE.(-0) RETRY
   SER1              20   17    433      8      10.407    152.015      154.877   0
   SER              339  339    478      1     173.863   2300.564     2305.387   0
   SER3               1    0    294    294       0.000      0.000        0.000   0
   SER4               1    0    500    500       0.000      0.000        0.000   0
   SER2              50   49    258      4      29.085    713.023      724.252   0


  STORAGE           CAP. REM. MIN. MAX.  ENTRIES AVL.  AVE.C. UTIL. RETRY DELAY
   K2                 2    0    0    2      416    1     1.986 0.993    0    17
   K4                 3    1    0    3      294    1     0.926 0.309    0     0
   K5                 4    4    0    4      500    1     0.782 0.195    0     0


  FEC XN    PRI       BDT      ASSEM   CURRENT   NEXT   PARAMETER    VALUE
     873     0     6325.036     873      24       25
     875     0     6328.378     875      24       25
     912     0     6332.519     912       0        1
     876     0     6332.683     876      12       13
     878     0     6332.704     878      12       13
     272     0     6336.891     272       6        7
     696     0     6351.692     696      18       19
```

За 8 часов:

K2 STORAGE 2

K4 STORAGE 3

K5 STORAGE 4

GENERATE 7,5

TRANSFER .5,METKA1,METKA2

METKA1 QUEUE SER

SEIZE K1

DEPART SER

ADVANCE 45,5

RELEASE K1

TRANSFER,OUTMETKA1

METKA2 QUEUE SER1

ENTER K2

DEPART SER1

ADVANCE 30,7

LEAVE K2

OUTMETKA1 TRANSFER .5,METKA3,METKA4

METKA3 QUEUE SER2

SEIZE K3

DEPART SER2

ADVANCE 30,7

RELEASE K3

TRANSFER,OUTMETKA3

METKA4 QUEUE SER3

ENTER K4

DEPART SER3

ADVANCE 20,3

LEAVE K4

OUTMETKA3 GATE SNF K5,VIXOD

QUEUE SER4

ENTER K5

DEPART SER4

ADVANCE 10,3

LEAVE K5

VIXOD TERMINATE

GENERATE 480

TERMINATE 1

START 1

Результат работы программы:

```
              START TIME              END TIME  BLOCKS  FACILITIES  STORAGES
                 0.000                 480.000    34        2           3


                     NAME                     VALUE
              K1                          10005.000
              K2                          10000.000
              K3                          10009.000
              K4                          10001.000
              K5                          10002.000
              METKA1                          3.000
              METKA2                          9.000
              METKA3                         15.000
              METKA4                         21.000
              OUTMETKA1                      14.000
              OUTMETKA3                      26.000
              SER                         10004.000
              SER1                        10003.000
              SER2                        10008.000
              SER3                        10006.000
              SER4                        10007.000
              VIXOD                          32.000


   LABEL              LOC   BLOCK TYPE      ENTRY COUNT  CURRENT COUNT  RETRY
                       1    GENERATE            71             0          0
                       2    TRANSFER            71             0          0
   METKA1              3    QUEUE               40            29          0
                       4    SEIZE               11             0          0
                       5    DEPART              11             0          0
                       6    ADVANCE             11             1          0
                       7    RELEASE             10             0          0
                       8    TRANSFER            10             0          0
   METKA2              9    QUEUE               31             0          0
                      10    ENTER               31             0          0
                      11    DEPART              31             0          0
                      12    ADVANCE             31             2          0
                      13    LEAVE               29             0          0
   OUTMETKA1          14    TRANSFER            39             0          0
   METKA3            15    QUEUE               16             3          0
                      16    SEIZE               13             0          0
                      17    DEPART              13             0          0
                      18    ADVANCE             13             1          0
                      19    RELEASE             12             0          0

                      20    TRANSFER            12             0          0
   METKA4            21    QUEUE               23             0          0
                      22    ENTER               23             0          0
                      23    DEPART              23             0          0
                      24    ADVANCE             23             1          0
                      25    LEAVE               22             0          0
   OUTMETKA3         26    GATE                34             0          0
                      27    QUEUE               34             0          0
                      28    ENTER               34             0          0
                      29    DEPART              34             0          0
                      30    ADVANCE             34             2          0
                      31    LEAVE               32             0          0
   VIXOD            32    TERMINATE           32             0          0
                      33    GENERATE             1             0          0
                      34    TERMINATE            1             0          0


   FACILITY         ENTRIES   UTIL.    AVE. TIME  AVAIL.  OWNER  PEND  INTER  RETRY  DELAY
     K1                11     0.958      41.800     1       18     0     0      0      29
     K3                13     0.786      29.007     1       49     0     0      0       3


   QUEUE           MAX  CONT.  ENTRY  ENTRY(0)  AVE.CONT.  AVE.TIME    AVE.(-0)  RETRY
     SER1            5    0      31       6       1.577     24.422      30.283     0
     SER            29   29      40       1      14.184    170.203     174.567     0
     SER3            1    0      23      23       0.000      0.000       0.000     0
     SER4            1    0      34      34       0.000      0.000       0.000     0
     SER2            3    3      16       4       0.760     22.812      30.416     0


   STORAGE         CAP.  REM.  MIN.  MAX.   ENTRIES  AVL.   AVE.C.  UTIL.  RETRY  DELAY
     K2              2     0     0     2       31      1     1.844   0.922    0      0
     K4              3     2     0     3       23      1     0.921   0.307    0      0
     K5              4     2     0     3       34      1     0.683   0.171    0      0


   FEC XN    PRI       BDT       ASSEM   CURRENT   NEXT   PARAMETER    VALUE
        63    0      480.388      63       30       31
        73    0      482.836      73        0        1
        64    0      484.920      64       12       13
        59    0      485.093      59       30       31
        49    0      487.567      49       18       19
        17    0      494.179      17       24       25
        67    0      503.740      67       12       13
        18    0      516.945      18        6        7
        74    0      960.000      74        0       33
```

2. Модель 2: количество генераций транзактов равно 3, ограничить очереди 5 местами с помощью TEST, организовать подсчет покинувших систему с каждой очереди. Моделировать в течении 12 часов.

```
K2 STORAGE 2
K4 STORAGE 3
K5 STORAGE 4

GENERATE 7,5
METKA TRANSFER .5,METKA1,METKA2

METKA1 TEST L Q$SER1,5,POTERI
QUEUE SER1
SEIZE K1
DEPART SER1
ADVANCE 45,5
RELEASE K1
TRANSFER,OUTMETKA1

METKA2 TEST L Q$SER2,5,POTERI
QUEUE SER2
ENTER K2
DEPART SER2
ADVANCE 30,7
LEAVE K2

OUTMETKA1 TRANSFER .5,METKA3,METKA4

METKA3 TEST L Q$SER3,5,POTERI
QUEUE SER3
```

```
SEIZE K3
DEPART SER3
ADVANCE 30,7
RELEASE K3
TRANSFER,OUTMETKA3

METKA4 TEST L Q$SER4,5,POTERI
QUEUE SER4
ENTER K4
DEPART SER4
ADVANCE 20,3
LEAVE K4

OUTMETKA3 GATE SNF K5,POTERI
QUEUE SER5
ENTER K5
DEPART SER5
ADVANCE 10,3
LEAVE K5
TRANSFER,VIXOD
POTERI TERMINATE
VIXOD TERMINATE
GENERATE 480
TERMINATE 1
START 1
```

Результат работы программы:

```
        START TIME          END TIME  BLOCKS  FACILITIES  STORAGES
             0.000            480.000    40        2          3


           NAME                    VALUE
        K1                     10005.000
        K2                     10000.000
        K3                     10009.000
        K4                     10001.000
        K5                     10002.000
        METKA                      2.000
        METKA1                     3.000
        METKA2                    10.000
        METKA3                    17.000
        METKA4                    24.000
        OUTMETKA1                 16.000
        OUTMETKA3                 30.000
        POTERI                    37.000
        SER1                   10004.000
        SER2                   10003.000
        SER3                   10008.000
        SER4                   10006.000
        SER5                   10007.000
        VIXOD                     38.000


  LABEL            LOC   BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                    1    GENERATE           71           0        0
  METKA             2    TRANSFER           71           0        0
  METKA1            3    TEST               40           0        0
                    4    QUEUE              16           5        0
                    5    SEIZE              11           0        0
                    6    DEPART             11           0        0
                    7    ADVANCE            11           1        0
                    8    RELEASE            10           0        0
                    9    TRANSFER           10           0        0
  METKA2           10    TEST               31           0        0
                   11    QUEUE              31           0        0
                   12    ENTER              31           0        0
                   13    DEPART             31           0        0
                   14    ADVANCE            31           2        0
                   15    LEAVE              29           0        0
  OUTMETKA1        16    TRANSFER           39           0        0
  METKA3           17    TEST               16           0        0
                   18    QUEUE              16           3        0
                   19    SEIZE              13           0        0
                   20    DEPART             13           0        0
                   21    ADVANCE            13           1        0
                   22    RELEASE            12           0        0
                   23    TRANSFER           12           0        0
  METKA4           24    TEST               23           0        0
                   25    QUEUE              23           0        0
                   26    ENTER              23           0        0
                   27    DEPART             23           0        0
```

	27	DEPART	23	0	0
	28	ADVANCE	23	1	0
	29	LEAVE	22	0	0
OUTMETKA3	30	GATE	34	0	0
	31	QUEUE	34	0	0
	32	ENTER	34	0	0
	33	DEPART	34	0	0
	34	ADVANCE	34	2	0
	35	LEAVE	32	0	0
	36	TRANSFER	32	0	0
POTERI	37	TERMINATE	24	0	0
VIXOD	38	TERMINATE	32	0	0
	39	GENERATE	1	0	0
	40	TERMINATE	1	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
K1	11	0.958	41.800	1	43	0	0	0	5
K3	13	0.786	29.007	1	49	0	0	0	3

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
SER2	5	0	31	6	1.577	24.422	30.283	0
SER1	5	5	16	1	4.431	132.923	141.785	0
SER4	1	0	23	23	0.000	0.000	0.000	0
SER5	1	0	34	34	0.000	0.000	0.000	0
SER3	3	3	16	4	0.760	22.812	30.416	0

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
K2	2	0	0	2	31	1	1.844	0.922	0	0
K4	3	2	0	3	23	1	0.921	0.307	0	0
K5	4	2	0	3	34	1	0.683	0.171	0	0

FEC XN	PRI	BDT	ASSEM	CURRENT	NEXT	PARAMETER	VALUE
63	0	480.388	63	34	35		
73	0	482.836	73	0	1		
64	0	484.920	64	14	15		
59	0	485.093	59	34	35		
49	0	487.567	49	21	22		
36	0	494.179	36	28	29		
67	0	503.740	67	14	15		
43	0	516.945	43	7	8		
74	0	960.000	74	0	39		