МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РФ

ФГБОУ ВО

Воронежский государственный

Специальность 09.03.02 «Информационные системы и технологии»

Кафедра Информационных технологий моделирования и управления

Отчет по практической работе

по   дисциплине «Имитационное моделирование систем»
(наименование учебной дисциплины)

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Работа защищена _____ _____
(Дата)   (Оценка)

МОДЕЛИРОВАНИЕ ВЫЧИСЛИТЕЛЬНЫХ СИСТЕМ С ПОМОЩЬЮ СИСТЕМЫ GPSS/PC

Задача 1.

```
MEM     STORAGE      2
ZEXP    FUNCTION     RN1,C12
0,0/.2,.22/.4,.51/.5,.69/.6,.92/.7,1.2/.8,1.61
.9,2.3/.95,3/.99,4.6/.999,6.9/1,100
GENERATE     8,6,,500
QUEUE        OCH1
ENTER        MEM,1
DEPART       OCH1
MET6    QUEUE        A2
TRANSFER     BOTH,MET1,MET2
MET1    SEIZE        CPU1
DEPART       A2
ADVANCE      5,FN$ZEXP
RELEASE      CPU1
TRANSFER     ,MET3
MET2    SEIZE        CPU2
DEPART       A2
ADVANCE      2,FN$ZEXP
RELEASE      CPU2
MET3    TRANSFER     .6,MET5,MET4
MET4    QUEUE        A3
SEIZE        DISK
DEPART       A3
ADVANCE      7,2
RELEASE      DISK
TRANSFER     ,MET6
MET5    LEAVE        MEM,1
TERMINATE    1
```

START   500

GPSS World - Untitled Model 5.9.1 - REPORT:2

File   Edit   Search   View   Command   Window   Help

Untitled Model 5

```
MEM STORAGE 2
ZEXP FUNCTION RN1,C12
0, 0/.2,.22/.4,.51/.5,.69/.6,.92/.7,1.2
.8,1.61/.9,2.3/.95,3/.99,4.6/.999,6.9/1,
100
GENERATE 8,6,,500
QUEUE OCH1
ENTER MEM,1
DEPART OCH1

MET6 QUEUE A2
TRANSFER BOTH,MET1,MET2
MET1 SEIZE CPU1
DEPART A2
ADVANCE 5,FN$ZEXP
RELEASE CPU1
TRANSFER ,MET3

MET2 SEIZE CPU2
DEPART A2
ADVANCE 2,FN$ZEXP
RELEASE CPU2

MET3 TRANSFER .6,MET5,MET4
MET4 QUEUE A3
SEIZE DISK
DEPART A3
ADVANCE 7,2
RELEASE DISK
TRANSFER ,MET6
MET5 LEAVE MEM,1
TERMINATE 1
START 500
```

Untitled Model 5.9.1 - REPORT

```
              GPSS World Simulation Report - Untitled Model 5.9.1
                   Sunday, March 05, 2023 08:33:39

         START TIME          END TIME  BLOCKS  FACILITIES  STORAGES
            0.000            6722.378     24        3           1

                  NAME                  VALUE
              A2                      10003.000
              A3                      10006.000
              CPU1                    10004.000
              CPU2                    10005.000
              DISK                    10007.000
              MEM                     10000.000
              MET1                        7.000
              MET2                       12.000
              MET3                       16.000
              MET4                       17.000
              MET5                       23.000
              MET6                        5.000
              OCH1                    10002.000
              ZEXP                    10001.000
```

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
	1	GENERATE	500	0	0
	2	QUEUE	500	0	0
	3	ENTER	500	0	0
	4	DEPART	500	0	0
MET6	5	QUEUE	1305	0	0
	6	TRANSFER	1305	0	0
MET1	7	SEIZE	693	0	0
	8	DEPART	693	0	0
	9	ADVANCE	693	0	0
	10	RELEASE	693	0	0
	11	TRANSFER	693	0	0
MET2	12	SEIZE	612	0	0
	13	DEPART	612	0	0
	14	ADVANCE	612	0	0
	15	RELEASE	612	0	0

For Help, press F1   Report is Complete.   Clock

Untitled Model 5 (continued)

```
TRANSFER BOTH,MET1,MET2
MET1 SEIZE CPU1
DEPART A2
ADVANCE 5,FN$ZEXP
RELEASE CPU1
TRANSFER ,MET3

MET2 SEIZE CPU2
DEPART A2
ADVANCE 2,FN$ZEXP
RELEASE CPU2

MET3 TRANSFER .6,MET5,MET4
MET4 QUEUE A3
SEIZE DISK
DEPART A3
ADVANCE 7,2
RELEASE DISK
TRANSFER ,MET6
MET5 LEAVE MEM,1
TERMINATE 1
START 500
```

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
MET2	12	SEIZE	612	0	0
	13	DEPART	612	0	0
	14	ADVANCE	612	0	0
	15	RELEASE	612	0	0
MET3	16	TRANSFER	1305	0	0
MET4	17	QUEUE	805	0	0
	18	SEIZE	805	0	0
	19	DEPART	805	0	0
	20	ADVANCE	805	0	0
	21	RELEASE	805	0	0
	22	TRANSFER	805	0	0
MET5	23	LEAVE	500	0	0
	24	TERMINATE	500	0	0

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
CPU1	693	0.745	7.230	1	0	0	0	0	0
CPU2	612	0.181	1.992	1	0	0	0	0	0
DISK	805	0.835	6.976	1	0	0	0	0	0

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
OCH1	206	0	500	3	99.871	1342.735	1350.840	0
A2	1	0	1305	1305	0.000	0.000	0.000	0
A3	1	0	805	420	0.229	1.909	3.992	0

STORAGE	CAP.	REM.	MIN.	MAX.	ENTRIES	AVL.	AVE.C.	UTIL.	RETRY	DELAY
MEM	2	2	0	2	500	1	1.991	0.995	0	0

For Help, press F1   Report is Complete.   Clock

Задача 2.

```
      ZEXP FUNCTION RN1,C12
      0,0/.2,.22/.4,.51/.5,.69/.6,.92/.7,1.2/.8,1.61
      .9,2.3/.95,3/.99,4.6/.999,6.9/1,500
      GENERATE 2,FN$ZEXP
      TRANSFER .2,MET2,MET1


      MET2 TRANSFER .25,MET4,MET3
      MET4 TRANSFER .333,MET6,MET5
      MET6 TRANSFER .5,MET8,MET7


      MET1 TEST L Q$OCH1,5,OUT
      QUEUE OCH1
      SEIZE DISK1
      DEPART OCH1
      ASSIGN 1,DISK1
      ADVANCE 7,1
      RELEASE DISK1
      TRANSFER ,MET9


      MET3 TEST L Q$OCH2,5,OUT
      QUEUE OCH2
      SEIZE DISK2
      DEPART OCH2
      ASSIGN 1,DISK2
      ADVANCE 5,3
      RELEASE DISK2
      TRANSFER ,MET9


      MET5 TEST L Q$OCH3,5,OUT
      QUEUE OCH3
      SEIZE DISK3
      DEPART OCH3
      ASSIGN 1,DISK3
      ADVANCE 4,2
      RELEASE DISK3
      TRANSFER ,MET9


      MET7 TEST L Q$OCH4,5,OUT
      QUEUE OCH4
      SEIZE DISK4
      DEPART OCH4
      ASSIGN 1,DISK4
      ADVANCE 25,25
```

```
        RELEASE DISK4
        TRANSFER ,MET9

MET8    TEST L Q$OCH5,5,OUT
        QUEUE OCH5
        SEIZE DISK5
        DEPART OCH5
        ASSIGN 1,DISK5
        ADVANCE 25,25
        RELEASE DISK5
        TRANSFER ,MET9

MET9    TEST L Q$OCH6,5,OUT
        QUEUE OCH6
        SEIZE CAN
        DEPART OCH6
        ADVANCE 1.7
        RELEASE CAN
        TERMINATE
OUT     TERMINATE

        GENERATE 150000
        TERMINATE 1
        START 1
```

GPSS World - Untitled Model 5.11.1 - REPORT:2

File   Edit   Search   View   Command   Window   Help

Untitled Model 5

```
ZEXP FUNCTION RN1,C12
0, 0/.2,.22/.4,.51/.5,.69/.6,.92/.7
.9,2.3/.95,3/.99,4.6/.999,6.9/1,100
GENERATE 2,FN$ZEXP
TRANSFER .2,MET2,MET1
MET2 TRANSFER .25,MET4,MET3
MET4 TRANSFER .333,MET6,MET5
MET6 TRANSFER .5,MET8,MET7

MET1 TEST L Q$OCH1,5,OUT
QUEUE OCH1
SEIZE DISK1
DEPART OCH1
ASSIGN 1,DISK1
ADVANCE 7,1
RELEASE DISK1
TRANSFER ,MET9

MET3 TEST L Q$OCH2,5,OUT
QUEUE OCH2
SEIZE DISK2
DEPART OCH2
ASSIGN 1,DISK2
ADVANCE 5,3
RELEASE DISK2
TRANSFER ,MET9

MET5 TEST L Q$OCH3,5,OUT
QUEUE OCH3
SEIZE DISK3
DEPART OCH3
ASSIGN 1,DISK3
ADVANCE 4,2
RELEASE DISK3
TRANSFER ,MET9

MET7 TEST L O$OCH4.5.OUT
```

Untitled Model 5.11.1 - REPORT

```
        GPSS World Simulation Report - Untitled Model 5.11.1
              Sunday, March 05, 2023 09:01:45

    START TIME        END TIME  BLOCKS  FACILITIES  STORAGES
       0.000        150000.000    55        6          0

        NAME                    VALUE
    CAN                      10008.000
    DISK1                    10012.000
    DISK2                    10004.000
    DISK3                    10010.000
    DISK4                    10002.000
    DISK5                    10006.000
    MET1                         6.000
    MET2                         3.000
    MET3                        14.000
    MET4                         4.000
    MET5                        22.000
    MET6                         5.000
    MET7                        30.000
    MET8                        38.000
    MET9                        46.000
    OCH1                     10011.000
    OCH2                     10003.000
    OCH3                     10009.000
    OCH4                     10001.000
    OCH5                     10005.000
    OCH6                     10007.000
    OUT                         53.000
    ZEXP                     10000.000
```

LABEL	LOC	BLOCK TYPE	ENTRY COUNT	CURRENT COUNT	RETRY
	1	GENERATE	70333	0	0
	2	TRANSFER	70333	0	0
MET2	3	TRANSFER	56342	0	0
MET4	4	TRANSFER	42283	0	0
MET6	5	TRANSFER	28194	0	0
MET1	6	TEST	13991	0	0

For Help, press F1   Report is Complete.   Clock

Untitled Model 5

```
ZEXP FUNCTION RN1,C12
0, 0/.2,.22/.4,.51/.5,.69/.6,.92/.7
.9,2.3/.95,3/.99,4.6/.999,6.9/1,100
GENERATE 2,FN$ZEXP
TRANSFER .2,MET2,MET1
MET2 TRANSFER .25,MET4,MET3
MET4 TRANSFER .333,MET6,MET5
MET6 TRANSFER .5,MET8,MET7

MET1 TEST L Q$OCH1,5,OUT
QUEUE OCH1
SEIZE DISK1
DEPART OCH1
ASSIGN 1,DISK1
ADVANCE 7,1
RELEASE DISK1
TRANSFER ,MET9

MET3 TEST L Q$OCH2,5,OUT
QUEUE OCH2
SEIZE DISK2
DEPART OCH2
ASSIGN 1,DISK2
ADVANCE 5,3
RELEASE DISK2
TRANSFER ,MET9

MET5 TEST L Q$OCH3,5,OUT
QUEUE OCH3
SEIZE DISK3
DEPART OCH3
ASSIGN 1,DISK3
ADVANCE 4,2
RELEASE DISK3
TRANSFER ,MET9

MET7 TEST L O$OCH4,5,OUT
```

Untitled Model 5.11.1 - REPORT

MET1	6	TEST	13991	0	0
	7	QUEUE	13912	0	0
	8	SEIZE	13912	0	0
	9	DEPART	13912	0	0
	10	ASSIGN	13912	0	0
	11	ADVANCE	13912	1	0
	12	RELEASE	13911	0	0
	13	TRANSFER	13911	0	0
MET3	14	TEST	14059	0	0
	15	QUEUE	14048	0	0
	16	SEIZE	14048	0	0
	17	DEPART	14048	0	0
	18	ASSIGN	14048	0	0
	19	ADVANCE	14048	0	0
	20	RELEASE	14048	0	0
	21	TRANSFER	14048	0	0
MET5	22	TEST	14089	0	0
	23	QUEUE	14086	0	0
	24	SEIZE	14086	0	0
	25	DEPART	14086	0	0
	26	ASSIGN	14086	0	0
	27	ADVANCE	14086	1	0
	28	RELEASE	14085	0	0
	29	TRANSFER	14085	0	0
MET7	30	TEST	14094	0	0
	31	QUEUE	5979	4	0
	32	SEIZE	5975	0	0
	33	DEPART	5975	0	0
	34	ASSIGN	5975	0	0
	35	ADVANCE	5975	1	0
	36	RELEASE	5974	0	0
	37	TRANSFER	5974	0	0
MET8	38	TEST	14100	0	0
	39	QUEUE	5928	4	0
	40	SEIZE	5924	0	0
	41	DEPART	5924	0	0
	42	ASSIGN	5924	0	0
	43	ADVANCE	5924	1	0

For Help, press F1   Report is Complete.   Clock

Untitled Model 5

```
DEPART OCH3
ASSIGN 1,DISK3
ADVANCE 4,2
RELEASE DISK3
TRANSFER ,MET9

MET7 TEST L Q$OCH4,5,OUT
QUEUE OCH4
SEIZE DISK4
DEPART OCH4
ASSIGN 1,DISK4
ADVANCE 25,25
RELEASE DISK4
TRANSFER ,MET9

MET8 TEST L Q$OCH5,5,OUT
QUEUE OCH5
SEIZE DISK5
DEPART OCH5
ASSIGN 1,DISK5
ADVANCE 25,25
RELEASE DISK5
TRANSFER ,MET9

MET9 TEST L Q$OCH6,5,OUT
QUEUE OCH6
SEIZE CAN
DEPART OCH6
ADVANCE 1.7
RELEASE CAN

TERMINATE
OUT TERMINATE
GENERATE 150000
TERMINATE 1
START 1
```

Untitled Model 5.11.1 - REPORT

MET8	38	TEST	14100	0	0
	39	QUEUE	5928	4	0
	40	SEIZE	5924	0	0
	41	DEPART	5924	0	0
	42	ASSIGN	5924	0	0
	43	ADVANCE	5924	1	0
	44	RELEASE	5923	0	0
	45	TRANSFER	5923	0	0
MET9	46	TEST	53941	0	0
	47	QUEUE	53933	0	0
	48	SEIZE	53933	0	0
	49	DEPART	53933	0	0
	50	ADVANCE	53933	0	0
	51	RELEASE	53933	0	0
	52	TERMINATE	53933	0	0
OUT	53	TERMINATE	16388	0	0
	54	GENERATE	1	0	0
	55	TERMINATE	1		

FACILITY	ENTRIES	UTIL.	AVE. TIME	AVAIL.	OWNER	PEND	INTER	RETRY	DELAY
DISK4	5975	0.986	24.762	1	70279	0	0	0	4
DISK2	14048	0.468	4.997	1	0	0	0	0	0
DISK5	5924	0.989	25.041	1	70273	0	0	0	4
CAN	53933	0.611	1.700	1	0	0	0	0	0
DISK3	14086	0.375	3.992	1	70334	0	0	0	0
DISK1	13912	0.649	6.999	1	70332	0	0	0	0

QUEUE	MAX	CONT.	ENTRY	ENTRY(0)	AVE.CONT.	AVE.TIME	AVE.(-0)	RETRY
OCH4	5	4	5979	51	4.260	106.872	107.791	0
OCH2	5	0	14048	7139	0.245	2.620	5.327	0
OCH5	5	4	5928	53	4.262	107.852	108.825	0
OCH6	5	0	53933	24074	0.309	0.859	1.552	0
OCH3	5	0	14086	8539	0.129	1.378	3.498	0
OCH1	5	0	13912	4488	0.610	6.582	9.716	0

FEC XN	PRI	BDT	ASSEM	CURRENT	NEXT	PARAMETER	VALUE
70273	0	150000.809	70273	43	44	1	10006.000
70335	0	150001.492	70335	0	1		

For Help, press F1   Report is Complete.   Clock

```
SEIZE DISK3
DEPART OCH3
ASSIGN 1,DISK3
ADVANCE 4,2
RELEASE DISK3
TRANSFER ,MET9

MET7 TEST L Q$OCH4,5,OUT
```

FEC XN	PRI	BDT	ASSEM	CURRENT	NEXT	PARAMETER	VALUE
70273	0	150000.809	70273	43	44	1	10006.000
70335	0	150001.492	70335	0	1		
70334	0	150001.739	70334	27	28	1	10010.000
70332	0	150003.759	70332	11	12	1	10012.000
70279	0	150010.364	70279	35	36	1	10002.000
70336	0	300000.000	70336	0	54		

For Help, press F1   Report is Complete.   Clock