Lab no: 8 *Date: 2025-04-14*

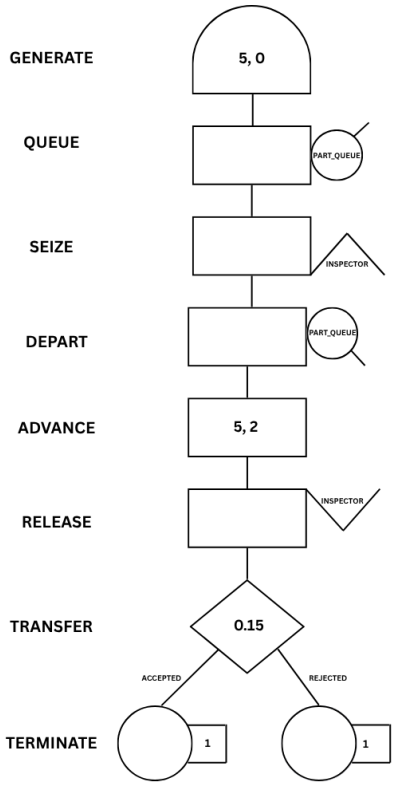
Title: GPSS

1. A machine tool in a manufacturing shop is turning out parts at the rate of two every 5 minutes. As they are finished, the parts go to an inspector, who takes 5±2 minutes to examine each one and reject about 15% of the parts. Now develop a block diagram and write the code for simulating the above problem using GPSS.

Source Code:

```
GENERATE 5, 0
QUEUE PART_QUEUE
SEIZE INSPECTOR
DEPART PART_QUEUE
ADVANCE 5, 2
RELEASE INSPECTOR
TRANSFER 0.15, ACCEPTED, REJECTED
ACCEPTED TERMINATE 1
REJECTED TERMINATE 1
START 100
```

Block Diagram:



Output:

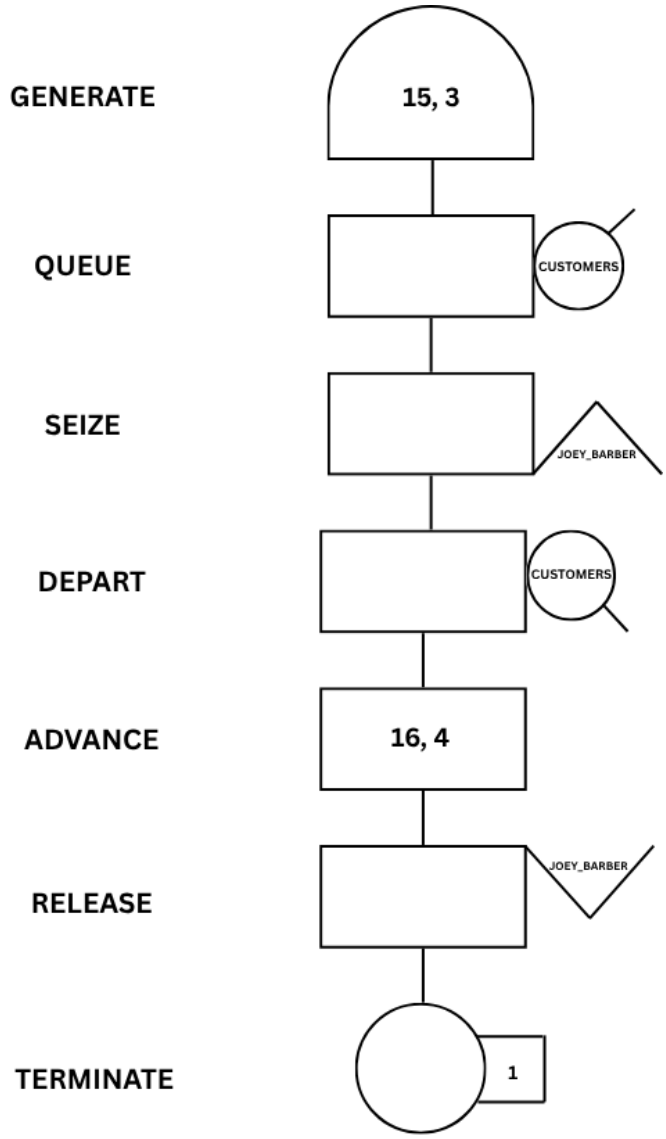
```
              GPSS World Simulation Report - Inspector.4.1


                   Tuesday, June 10, 2025 13:45:02

           START TIME           END TIME  BLOCKS  FACILITIES  STORAGES
                0.000            509.712     9        1          0


              NAME                       VALUE
           ACCEPTED                       8.000
           INSPECTOR                  10001.000
           PART_QUEUE                 10000.000
           REJECTED                       9.000


 LABEL              LOC  BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                    1    GENERATE           101             0       0
                    2    QUEUE              101             0       0
                    3    SEIZE              101             1       0
                    4    DEPART             100             0       0
                    5    ADVANCE            100             0       0
                    6    RELEASE            100             0       0
                    7    TRANSFER           100             0       0
ACCEPTED            8    TERMINATE           87             0       0
REJECTED            9    TERMINATE           13             0       0


FACILITY         ENTRIES  UTIL.   AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY
 INSPECTOR         101    0.968       4.886  1      101    0    0     0       0


QUEUE              MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME   AVE.(-0) RETRY
 PART_QUEUE          2    1    101     14     0.521      2.629      3.052   0


CEC XN    PRI          M1      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
   101     0         505.000    101      3      4


FEC XN    PRI          BDT     ASSEM  CURRENT  NEXT  PARAMETER    VALUE
   102     0         510.000    102      0      1
```

2. Customers arrive at Joey Barbershop one every 15±3 minutes and it takes Joey 18±2 minutes to cut hair of a customer. Create a GPSS model with block diagram for the Barbershop using the concept of facility and run the simulation for 9 hours.

Source Code:

```
GENERATE 15,3
QUEUE CUSTOMERS
SEIZE JOEY_BARBER
DEPART CUSTOMERS
ADVANCE 16,4
RELEASE JOEY_BARBER
TERMINATE 1
START 540
```

Block Diagram:



Output:

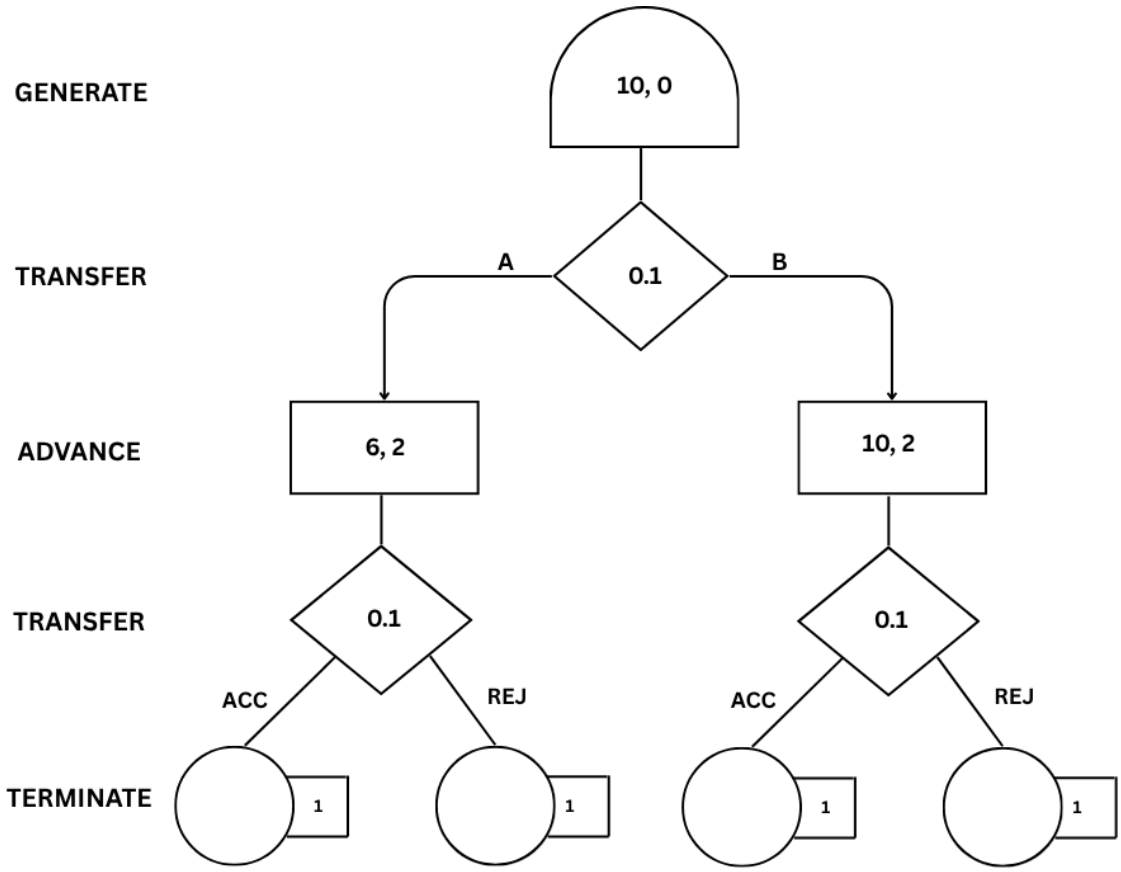
```
              GPSS World Simulation Report - barber.6.1


                    Tuesday, June 10, 2025 14:44:53

          START TIME           END TIME  BLOCKS  FACILITIES  STORAGES
               0.000           8671.248     7        1          0


             NAME                       VALUE
          CUSTOMERS                   10000.000
          JOEY_BARBER                 10001.000


 LABEL              LOC  BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                    1    GENERATE           580             0       0
                    2    QUEUE              580            39       0
                    3    SEIZE              541             1       0
                    4    DEPART             540             0       0
                    5    ADVANCE            540             0       0
                    6    RELEASE            540             0       0
                    7    TERMINATE          540             0       0


FACILITY         ENTRIES  UTIL.   AVE. TIME AVAIL. OWNER PEND INTER RETRY DELAY
 JOEY_BARBER       541    0.998      15.997  1      541    0    0     0     39


QUEUE              MAX CONT. ENTRY ENTRY(0) AVE.CONT. AVE.TIME   AVE.(-0) RETRY
 CUSTOMERS          40   40    580      1    18.435    275.609    276.085   0


CEC XN    PRI          M1      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
   541     0        8091.863    541      3       4


FEC XN    PRI          BDT     ASSEM  CURRENT  NEXT  PARAMETER    VALUE
   581     0        8674.310    581      0       1
```

3. Parts are being made at the rate of one every 10 minutes. They are of two types, A and B. And are mixed randomly with about 10% being type B. A separate inspector is assigned to examine each part. Inspection of part A takes 6+2 minutes while B takes 10+2 minutes. Both inspectors reject 10% of the parts they inspect. Draw GPSS block diagram to simulate the above problem for 100 parts.

Source Code:

```
GENERATE 10,0
TRANSFER 0.1 A B
A ADVANCE 6,2
TRANSFER 0.1 ACC REJ

B ADVANCE 10,2
TRANSFER 0.1 ACC REJ

ACC TERMINATE 1
REJ TERMINATE 1
START 100
```

Block Diagram:



Output:

```
            GPSS World Simulation Report - parts.3.1


                 Wednesday, June 11, 2025 18:55:21

          START TIME           END TIME  BLOCKS  FACILITIES  STORAGES
               0.000           1005.684     8        0          0


              NAME                         VALUE
          A                                 3.000
          ACC                               7.000
          B                                 5.000
          REJ                               8.000


 LABEL              LOC  BLOCK TYPE     ENTRY COUNT CURRENT COUNT RETRY
                    1    GENERATE            100              0       0
                    2    TRANSFER            100              0       0
A                   3    ADVANCE              88              0       0
                    4    TRANSFER             88              0       0
B                   5    ADVANCE              12              0       0
                    6    TRANSFER             12              0       0
ACC                 7    TERMINATE            90              0       0
REJ                 8    TERMINATE            10              0       0


FEC XN    PRI         BDT      ASSEM  CURRENT  NEXT  PARAMETER    VALUE
   101     0        1010.000    101      0       1
```