Example 4

```
* Define Ampervariables
                INTEGER     &LIMIT
                LET             &LIMIT=1000
* Block Statements
                GENERATE    10,5
                QUEUE           LINE
                SEIZE             CHECKOUT
                ADVANCE        7,5
                RELEASE        CHECKOUT
                DEPART          LINE
                TABULATE     RES
                TERMINATE   1
 RES            TABLE           M1,5,5,10
*
                START           &LIMIT
                END
```

TABULATE and TABLE

- TABULATE is used to collect histogram data for a particular performance measure.
- The placement of TABULATE is used to mark the time.
- You can have two tables for each of delay time and total waiting time (response time).
- The parameter A contains address of the TABLE definition.
- TABLE A, B, C, D

  A: which standard numerical attribute (SNA) to tabulate.

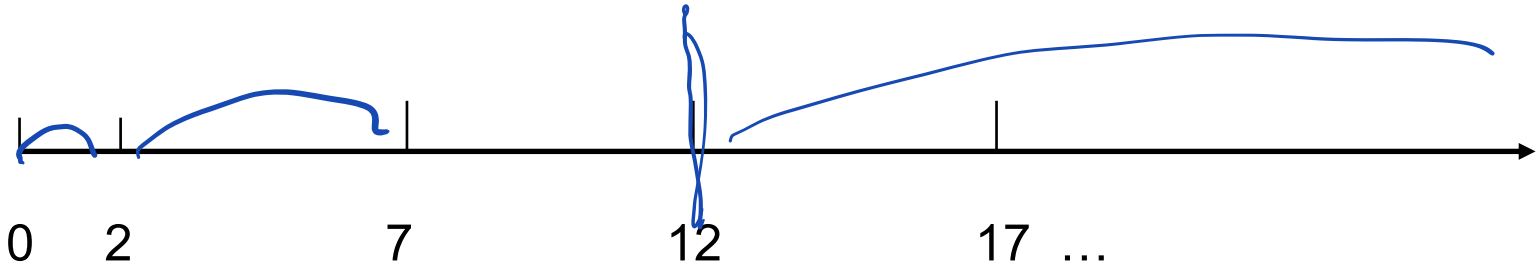
  B: upper limit of the first interval.

  C: width of each interval

  D: number of intervals

TABULATE and TABLE cont.

- RES TABLE M1,2,5,10



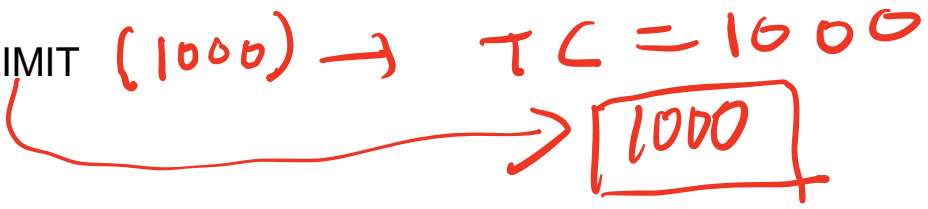
- SNA's:
  M1 – transit time = Current clock – arrival time
  Fj – current status of facility j (busy =1, idle =0)
  Sj – current number of busy servers in storage j

TERMINATE

- Sink of transactions - Destroy the transaction.
- The parameter specifies the number of units to be deducted from *transaction count* (specify by START block).
- When *transaction count* = 0, the simulation is terminated.
- If the parameter is left to blank, the termination count is not changed but the transaction is deleted.

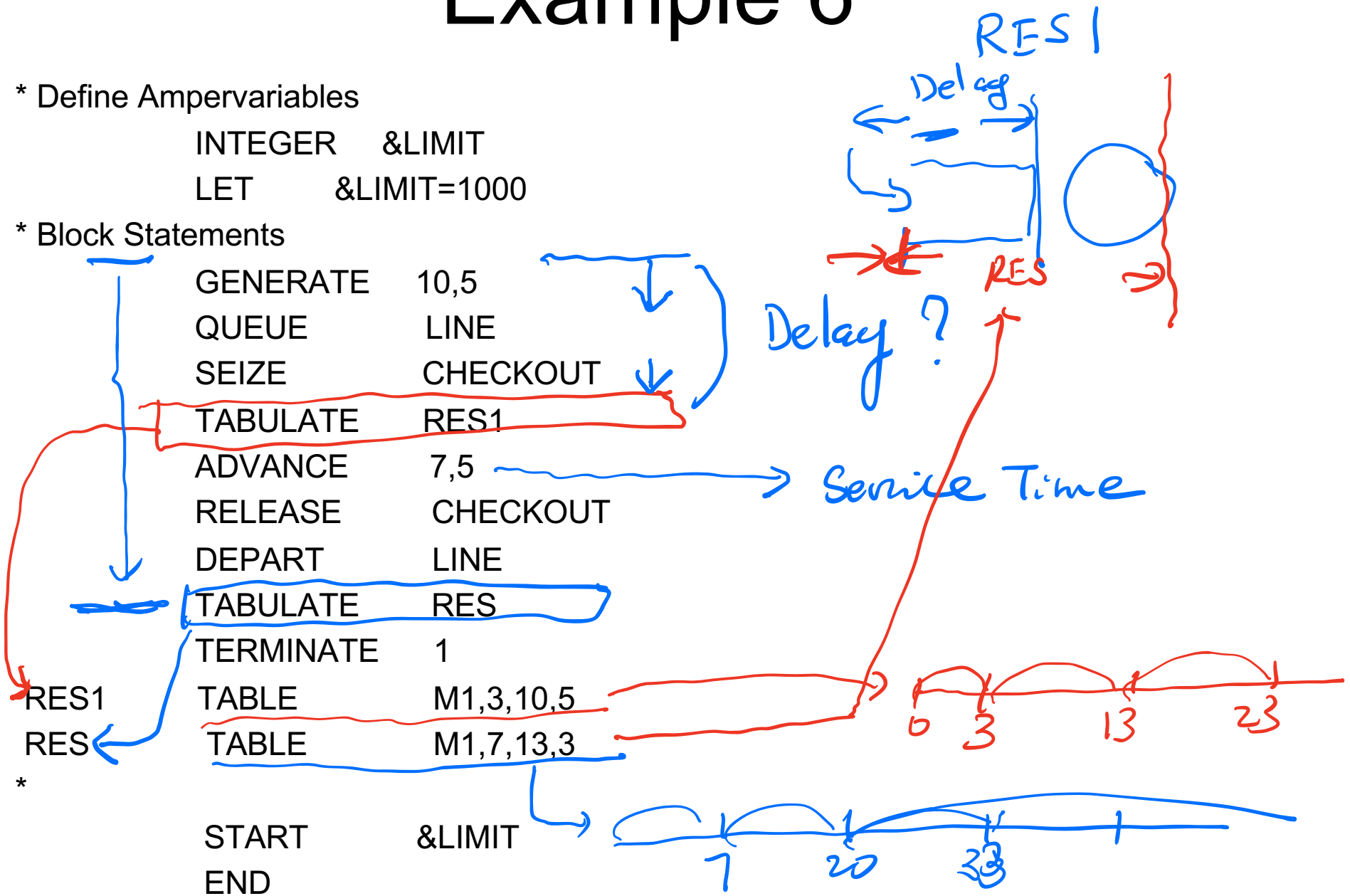
Example 5

```
*12345678901234567890123456789O
                SIMULATE
* Define Ampervariables
                INTEGER     &LIMIT
                LET         &LIMIT=1000
* Block Statements
                GENERATE    10,5
                QUEUE       LINE
                SEIZE       CHECKOUT
                ADVANCE     7,5
                RELEASE     CHECKOUT
                DEPART      LINE
                TABULATE    RES
                TERMINATE   1
    RES         TABLE       M1,5,5,10
*
                START       &LIMIT
                END
```



Example 6

```
* Define Ampervariables
                INTEGER     &LIMIT
                LET         &LIMIT=1000
* Block Statements
                GENERATE    10,5
                QUEUE       LINE
                SEIZE       CHECKOUT
                TABULATE    RES1
                ADVANCE     7,5
                RELEASE     CHECKOUT
                DEPART      LINE
                TABULATE    RES
                TERMINATE   1
RES1            TABLE       M1,3,10,5
 RES            TABLE       M1,7,13,3
*
                START       &LIMIT
                END
```



TRANSFER

- Move the transactions to different parts based on uniform random variate:

  TRANSFER .250, ROUTE1, ROUTE2

  - a uniform random variate RN1: three-digit integer from (0,999], is generated.

  if RN1 < 250 ⇒ go to ROUTE 2

  else ⇒ go to ROUTE 1

- Example: TRANSFER .4, TAB, TEL

  A transaction enter this block is to be transferred to TAB (60%) and TEL (40%) respectively.

Unconditional Transfer

- TRANSFER ,label

Example:

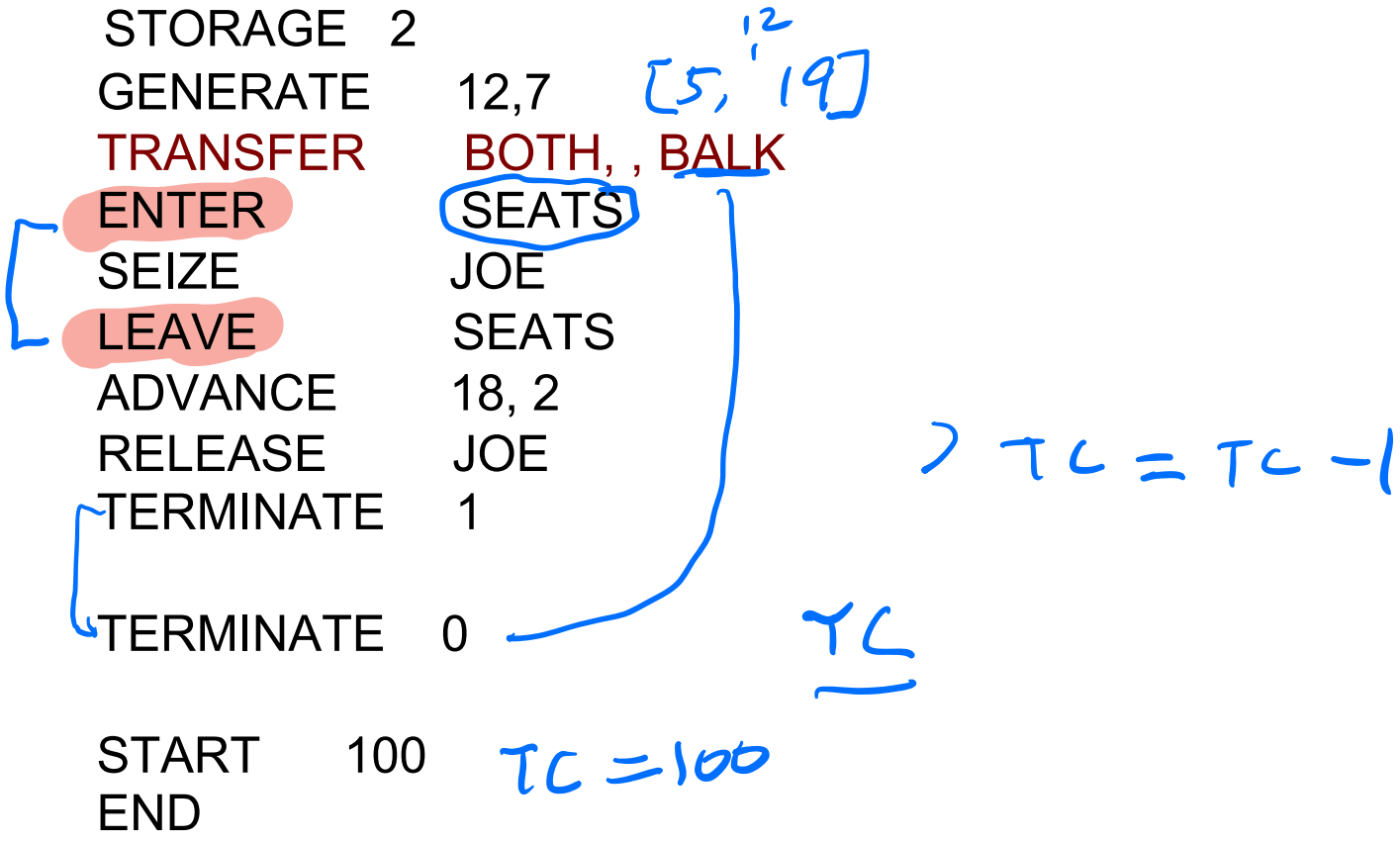
```
*                                  objects arrive from source 1
                    GENERATE    30, ,15
                    TRANSFER    ,CONVEYOR
*                                  objects arrive from source 2
                    GENERATE    30
CONVEYOR            ADVANCE     250          conveying time
                    TERMINATE   1
```

TRANSFER in BOTH-Mode

- TRANSFER BOTH, A, B

  - an Xact tries to move into the A-block. If the A-block denies entry, then it tries to move into the B-block.

```
SEATS       STORAGE   2
            GENERATE    12,7
            TRANSFER    BOTH, , BALK
            ENTER       SEATS
            SEIZE       JOE
            LEAVE       SEATS
            ADVANCE     18, 2
            RELEASE     JOE
            TERMINATE   1
*
BALK        TERMINATE   0
*
            START   100
            END
```



STORAGE

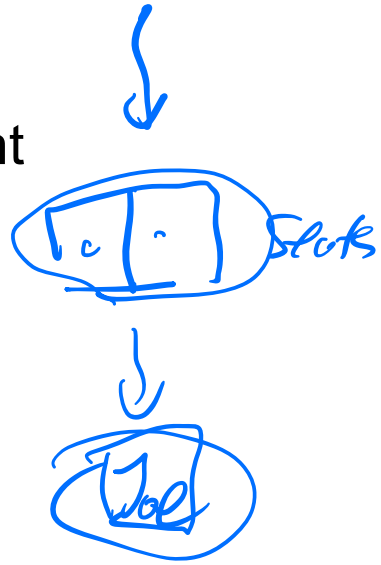
- STORAGE: define total number of servers for each storage facility.
- Labelled STORAGE

  Label STORAGE A A is the capacity of the Storage
- Example

  TELLERS STORAGE 3
  WAITAREA STORAGE 10
  WORKERS STORAGE 5
- More than one Storages can be defined in one statement
- Example:

  STORAGE S1,6/S2,3

  storage 1 (SNA is S1) has 6 servers and
  storage 2 (SNA is S2) has 3 servers.



ENTER and LEAVE

- Similar to SEIZE and RELEASE except that the service facility may have multiple servers.
- ENTER A,B

  LEAVE A,B

  A – the storage facility

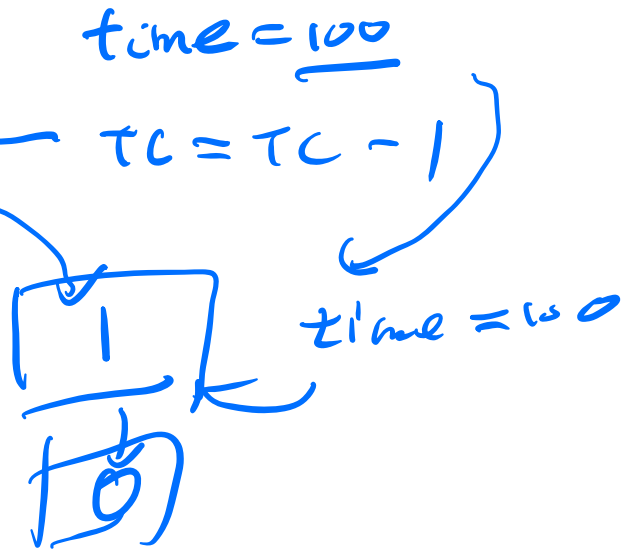
  B – number of servers required (default is 1)
- The Xact is allowed to enter the ENTER block only if the number of servers it required is less than or equal to the number of idle servers.
- It is used to model single queue, multiple servers

End of Simulation

- Simulation can be terminated after a pre-defined time
- Example

* Xact is deleted but the termination count is not reduced

```
                TERMINATE
*
GENERATE        100
TERMINATE       1
START           1
END
```



Example 7

```
* 234567890123456789023456789023456789O
                SIMULATE
* Define Ampervariables
                INTEGER    &LIMIT
                LET        &LIMIT=100
•     Block Statements
                DOCTORS      STORAGE    3
                GENERATE     4,2
                QUEUE        WAITING_ROOM
                ENTER        DOCTORS
                ADVANCE      3,2
                LEAVE        DOCTORS
                DEPART       WAITING_ROOM
                TABULATE     RES
                TERMINATE    1
   RES      TABLE          M1,0,2,4
*
*               STORAGE     S1,3
                START       &LIMIT
                END
```