Data Structures and Algorithms II
Simulation Data Structure and Pseudocode

Priority Queue (PQ) holds:

- Arrival Events
- Departure events

FIFO Queue (FIFO) holds Arrivals waiting for service

```
class Customer {
  float arrivalTime;
  float startOfServiceTime;
  float departureTime;
  Customer * nextCust; // for linked FIFO
};
```

Pseudocode:

```
Place first arrivals in PQ.
Set serverAvailableCnt equal to M.

while(PQ is not empty)
    processNextEvent()
    if(moreArrivals and PQ.size <= M+1)
      add arrivals to PQ
Show Simulation Results

processStatistics()
   if(currentWaitTime > 0)
      increment customerWaitedCnt
   totalWaitTime = totalWaitTime + currentWaitTime
   accumulate serviceTime
   if(serverAvailableCnt == M)
      accumulate idleTime
```

```
processNextEvent()
   if(event is an Arrival)
      if(serverAvailableCnt > 0)
         decrement serverAvailableCnt
         startOfServiceTime = ArrivalTime
         interval = getNextRandomInterval(mu)
         departureTime = arrivaltime + interval
         place departureEvent in PQ
      else
         place Customer in FIFO
   else // processing a departure event
      increment serverAvailableCnt
      processStatistics()
      if(Customer in FIFO)
         remove Customer from FIFO
         startOfServiveTime = time of departure event
         interval = getNextRandomInterval(mu)
         departureTime = startOfServiveTime + interval
         place departureEvent in PQ
         decrement serverAvailableCnt
```