Assignment Breakdown:

* Read File called runSimulation.txt that will contain four numbers to be read into the program
* Create a priority queue with a length of 100 and fill it when there is M+1 people in the queue
* Process events in the order In which they happen
* Output the calculated results and the expected results next to each other to compare them

Functions Needed to Complete Assignment:

* Read File called runSimulation.txt that will contain four numbers to be read into the program
  + This can be done with successive calls of fscanf and does not need to be done in a function.
* Create a priority queue with a length of 100 and fill it when there is M+1 people in the queue
  + Need a function to create a heap called: createHeap()
    - Creates a heap that contains an array of 100 person structures, and an integer to keep track of how many people are in the heap at the given time.
    - Will return a pointer to a heap
  + Need a function to create a fifo queue:
    - Create
  + Need a function that can fill the queue up with people whenever it is called: fillQ
    - This function takes in a pointer to a heap, the amount of people left in the program to be run, the average arrival time of the people, and the amount of time that has accumulated since the last arrivals.
    - This functions will check how many people that are left to be processed. Then it fills the queue to capacity while decrementing the amount of people to be processed. The times are incremented as each person is processed.
    - This function has no return value
* Process events in the order in which they happen
  + Need a function to process the next event and do the respective action: processNextEvent
    - This function will take in a priority queue, a fifo queue, the amount of servers, the actual servers available, and all the totals for the queue stat calculations
    - The function will first check to see if there was an arrival or a departure. If there was an arrival and there is a server available then the amount of servers will be decremented and the createDepartureSAvailable function will be called. If there is no server the person will be added to the fifo queue. If it’s a departure the amount of servers will be incremented and the stats will be calculated for the departure. If there is someone in the fifo queue then then the amount of servers will be decremented and that person will be serviced by calling removeFromFifo.
  + Need a function that creates a departure when a server is available: createDepartureSAvailable
    - This function will take in a person, the amount of average time it takes for them to be serviced, and the priority queue
    - The persons start of service time and departure time will be calculates and then they will be added back to priority queue as a departure
  + Need a function to handle departures in the fifo queue: removeFromFifo
    - This function will take in a priority queue, a fifo queue, the time that they started service and the amount of time it takes for them to be serviced
    - This function will pop off the first person from the fifo queue and then computes that persons start of service time as the time passed int, their departure time as a function of mu, and then puts them back into the priority queue
  + Need a function to tell how many people are in the fifo queue: getFiFoAmount
    - This function takes in a fifo queue
    - It will return the integer amount from the fifo queue data structure.
* Output the calculated results and expected results next to each other.
  + This was short enough and was only going to be done once so a function was not necessary.