Program Requirements:

* Each car can contain at most MAXPERCAR people
* Day is 600 minutes (10 hrs) long – 9am – 7pm
* 7 sec to load car and ride lasts 53 seconds
* Thread for each car (CARNUM total car threads)
* Arrivals are updated every minute using poissonRandom(meanArrival)
* Mean arrival given by
  + 09:00:00--10:59:59, meanArrival = 25 persons per minute
  + 11:00:00--13:59:59, meanArrival = 45 persons per minute
  + 14:00:00--15:59:59, meanArrival = 35 persons per minute
  + 16:00:00--18:59:59, meanArrival = 25 persons per minute
* Thread to take care of incoming people
  + Accept into waiting line, or reject
  + Write status to output file
    - XXX arrive YYY reject ZZZ wait-line WWW at HH:MM:SS
  + At end of day, display:
    - The total number of people arrived
    - The total number of people taking the ride
    - The total number of people going away due to the long waiting line
    - The average waiting time per person (in minutes)
    - Determine the length of the line at its worst case, and the time of day at which that occurs.
* Threads synchronize every minute
* No threads should be busy waiting

Report Requirements:

* Written description of code

• Fill out table with results from MAXPERCAR M=7,9, and CARNUM N=4,6

* Provide three figures to illustrate for CARNUM=2,4,6, MAXPERCAR=7:   
  o The number of persons arrived in every minute. (one curve in one figure)   
  o The number of persons reject in every minute. (three curves in one figure)   
  o The number of persons waiting in every minute. (three curves in one figure)

**Arrivals:**

if minutes is:

0-119 -> mean\_arrivals = 25

120-299 -> mean\_arrivals = 45

300-419 -> mean\_arrivals = 35

420-600 -> mean\_arrivals = 25

number\_arrived = poissonRandom(mean\_arrivals)

**Car:**

waiting time?

**Main:**

num\_waiting = 0

num\_rejected = 0

num\_arrivals = 0

num\_cars = NUMCARS

for minute in 600 minutes:

num\_arrivals = genArrivals(minute)

num\_waiting += num\_arrivals

if num\_waiting > MAXWAITPEOPLE:

num\_rejected = num\_waiting - MAXWAITPEOPLE

num\_waiting = MAXWAITPEOPLE

Write minutes, num\_waiting, num\_rejected, and num\_arrivals to output file

while car is not full:

if people in line:

add person to car

waiting time 7 sec

num\_cars --

send car -> create thread with call car function

when thread exits -> num\_cars++