

CS307  
Homework 1 Report

We have 3 threads in our program. 1 is the main thread and other 2 is the child threads. Main thread is for the main reservation system and child threads are for travel agency threads. In child threads we will do the reservations of seats of plane and in the main thread we'll be checking if the plane capacity is full.

We first with creating global variables that will be shared between threads. We have an array of integers which will correspond to seats in the plane and this will store agencies that reserved that seat. This array is called `seats`. Following that we integers that are named `turn` and `remainingSeats`. `Turn` will be used in busy waiting, to understand which thread will be working at that time. `remainingSeats` will be used to check if the plane is full or not.

We first start with using `srand(time(NULL))` to have random seed to generate different random numbers. Then in main, we initialize all array indexes to 0, to start with an empty plane. Then we created our child threads. These threads use `firstReserver` and `secondReserver` functions, which both have the same flow. Only differences they have are the print statements and turn conditions.

At first we check if the plane is empty. Then we head into the busy waiting part, since we don't have a non-critical region. When one thread's turn comes, it creates two random numbers, for row and column. Then again checks for if the plane is full (this is due to while thread was busy waiting for its turn, other thread might have reserved a seat and plane might have become full) and if that seat is empty. If we satisfy the conditions, we book the seat and decrease the `remainingSeats`. Then since we have to print "No seats left" if we entered the critical region and couldn't make a reservation, we have `reserved` variable. We make reserved variable true if we were able to make a reservation.

In main we continuously check the `remainingSeats` variable in order to see if child threads are done. If so, we join the child threads and print "Plane is full". Then we print our array indices one by one.