

CS 300 Design Activity - Practice for Airport

You have been hired to build software to allow students to sign up for courses! Bye bye BoxerOnline!

Each course has a CourseID (1-9) and can enrolled 10 students and have an additional 2 students on the waitlist. Students on the waitlist should be maintained in the order in which they added the course.

Each student has a StudentID and scheduling priority (0 is the highest priority). A student will request three courses. When it is that student's turn to register (via priority), the system will attempt to enroll the student in their first choice course. Next, the system will attempt to enroll the student into their second choice. If the student did not get enrolled into *both* of those choices, the system attempts to enroll the student in their third choice. If a class is full (10 students), but has space on the waitlist, the student must be placed on the waitlist. Being placed on the waitlist does not count as being enrolled in the course (a student can be on the waitlist for one course and enrolled in two others). A student who is enrolled in their first two choices is never put on the waitlist for the third choice.

After all the students have registered, summary statistics must be presented. These include:

- Number of students who got their first choice.
- Number of students who got their second choice.
- Number of students who got their third choice.
- Number of students who did not enroll in any course.
- Number of full classes.
- Number of classes with full waitlists.

File format:

StudentID Priority FirstChoiceCourseID SecondChoiceCourseID ThirdChoiceCourseID

A sample data file follows. Note you must read the entire file before placing any student into a course.

```
1024 3 1 3 4
1023 2 4 3 2
1000 9 1 2 4
```

Your task today:

Design the data structures you will need to store this data.

Define the functions in each module that you will write.

Makefiles!

► Your Airport Makefile must be able to (re)build list.o, pqueue.o, and queue.o. Your airport driver must depend on each of those three object files.

► Your Airport Makefile must clean the list, pqueue, and queue projects when clean is invoked:

clean:

```
cd ../GenericDynamicList; make clean
cd ../GenericDynamicPriorityQ; make clean
cd ../GenericDynamicQueue; make clean
rm -f bin/*.o bin/airportdriver
```

► airport.o must depend on each .h file that airport.h or airport.c directly includes!