2019 Spring - CSCI 151 — Programming Assignment

Flight Management and Booking
Part 4

Submission Deadline:
Monday 22 April 2019 at 23:59.

This is Part 4 of the 4-part Programming Assignment, which is worth 20% of the final grade. The 4 parts contribute to define a system for Flight Management and Booking. Please be aware that:

1. you are not allowed to discuss the assignment online;
2. you will have to submit each of the 4 parts through Moodle by the deadline;
3. you will have a 10% penalty of the total grade of the 4-part Programming Assignment for each part that you submit up to 24 hour late;
4. you will have a 25% penalty of the total grade of the 4-part Programming Assignment for each part of the assignment that does not run;
5. after all 4 parts are graded, you may be selected for live grading, in order to assess whether you understand the code and you are able to change it according to the requirements given by the examiner;
6. you will get a 0 as the total grade of the 4-part Programming Assignment if
   - you miss the submission of any of the 4 parts (submission will close 24 hours after the deadline)
   - you are selected for live grading and either you do not show up at the scheduled time or your performance does not confirm the grade of the 4 parts of the assignment;
   - you have plagiarised any of the assignment parts (either by sharing code with peers or by reusing code found online);
7. you will lose points in any of the following cases
   - you do not use appropriate code indentation;
   - you do not use comments to illustrate your code.

Do not change the names of data structures, their components, variables and functions as shown in this assignment!

1 Data Structures

Extend the code of Part 3 of the programming assignment with the following new data structure definition.

Booking information: a `struct` type `seating` with the following fields:

- `number` of type `int` to define the row number of the seats;
- `space` of type `char` to define the column number of the seats (e.g, 'A', 'B', 'C', 'D', 'E', 'F');
- `avail` of type `char` to define the availability of seat (i.e., '+' is available and '-' is not available);

Seating list: an array `seatList` of elements of type `seating`.

2 Functions

Define the following functions:

- `void displaySeatMap (const seating seatList[], int k)`

  that outputs to the console seat map information using the format in the example in Figure 1;

- `void assignSeat (const booking bookingList[], const flight flightSched[], seating seatList[], int i, int j, int k)`

  that requests a seat selection for a passenger and outputs the selection information to the console using the format in the example in Figure 3;

where `i` is the number of elements of `bookingList`, `j` is the number of elements of `flightSched`, and `k` is the number of elements of `seatList`.

3 Main

Read the information in file `seating.txt` to initialise array `seatList`. Store all information for the seats and create the following *Flight Management Menu* (as shown in Figure 5) for user's selection.

1 To view all bookings in `bookingList`;

2 To search a booking in `bookingList` by using `last name` and `pnr`;

3 To view available seats in `seatList` by using the format in the example in Figure 1 (the seats setting is simulated from Figure 2);

4 To assign seat for a booking by using `last name` and `pnr` as shown in Figure 3. Only available seat can be assigned (e.g., 24F+);

5 To display assigned seat in the seat map by using the format in the example in Figure 4; the assigned seat will be shown in the seat map with an asterisk symbol (e.g., 24F*).

6 To exit;

Note that this menu (i.e., Item 3, 4 and 5) is an extension from `Booking Search Menu` in Part 3 of your assignment. You should replace the menu in Part 3 of your assignment with this new menu and call all required functions in the menu. Also, you must convert the user's input into upper case (if lower case letters are entered) for `searchBooking` function and `assignSeat` function.

4 Submission Procedure

Please upload your work on Moodle as one single zipped file containing the **entire project folder**.
Deadline: **Monday 22 April 2019 at 23:59**.
Submissions will close on Tuesday 23 April 2019 at 23:59.

```
  1A+  1B-  1C+  1D+
  2A+  2B+  2C-  2D-
  3A-  3B+  3C+  3D+
  4A+  4B-  4C-  4D-  4E+  4F+
  5A+  5B-  5C-  5D-  5E-  5F-
  6A-  6B-  6C+  6D+  6E+  6F+
  7A-  7B+  7C+  7D+  7E-  7F+
  8A-  8B+  8C+  8D+  8E+  8F-
  9A+  9B+  9C+  9D+  9E-  9F+
  10A+  10B-  10C-  10D-  10E-  10F+
  11A-  11B-  11C-  11D+  11E-  11F-
  12A-  12B-  12C+  12D-  12E-  12F-
  13A-  13B+  13C+  13D+  13E-  13F-
  14A-  14B-  14C-  14D-  14E-  14F-
  15A-  15B-  15C-  15D+  15E+  15F+
  16A-  16B+  16C+  16D+  16E-  16F+
  17A-  17B+  17C+  17D+  17E+  17F+
  18A+  18B+  18C-  18D+  18E-  18F-
  19A-  19B-  19C-  19D-  19E-  19F+
  20A+  20B+  20C+  20D+  20E-  20F+
  21A+  21B-  21C+  21D+  21E+  21F+
  22A+  22B+  22C+  22D+  22E-  22F-
  23A-  23B+  23C+  23D+  23E+  23F+
  24A+  24B+  24C+  24D+  24E+  24F+
  25A+  25B+  25C-  25D-  25E+  25F+
  26A-  26B-  26C-  26D-  26E-  26F-
Total seats: 150
Total available seats: 81
```

Figure 1: Display Seat Map: console output

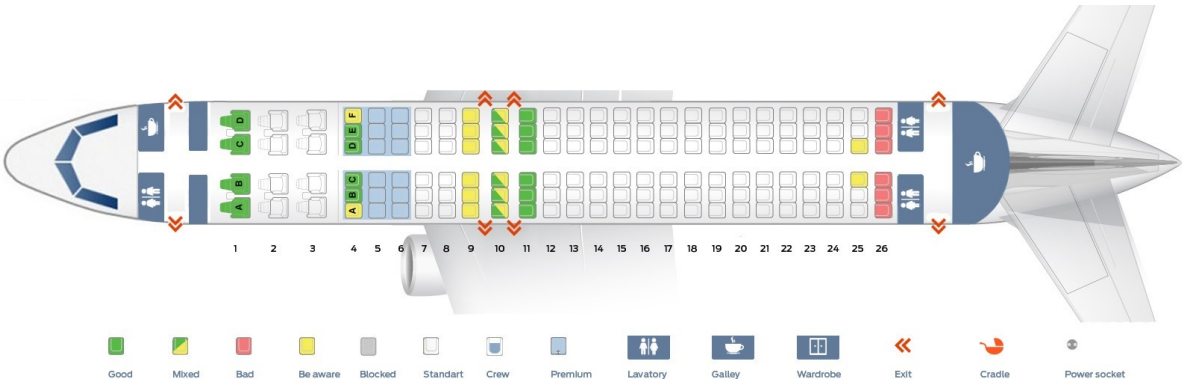

Figure 2: Flight Seat Map.

```
Enter Last Name: scott
Enter PNR: nqrr9

Name: TRAVIS/SCOTT
Gender: M
Age: 42
Booking Class: J
Departure Date: June-10-2019
Flight Number: SU 502
Departure Time: 07:30

Enter seat number: 26
Enter seat space: f
Seat 26F is not available

Enter seat number: 24
Enter seat space: f
Seat 24F is confirmed.
```

Figure 3: Assign Seat for a Booking: selection and console output

```
  1A+  1B-  1C+  1D+
  2A+  2B+  2C-  2D-
  3A-  3B+  3C+  3D+
  4A+  4B-  4C-  4D-  4E+  4F+
  5A+  5B-  5C-  5D-  5E-  5F-
  6A-  6B-  6C+  6D+  6E+  6F+
  7A-  7B+  7C+  7D+  7E-  7F+
  8A-  8B+  8C+  8D+  8E+  8F-
  9A+  9B+  9C+  9D+  9E-  9F+
  10A+  10B-  10C-  10D-  10E-  10F+
  11A-  11B-  11C-  11D+  11E-  11F-
  12A-  12B-  12C+  12D-  12E-  12F-
  13A-  13B+  13C+  13D+  13E-  13F-
  14A-  14B-  14C-  14D-  14E-  14F-
  15A-  15B-  15C-  15D+  15E+  15F+
  16A-  16B+  16C+  16D+  16E-  16F+
  17A-  17B+  17C+  17D+  17E+  17F+
  18A+  18B+  18C-  18D+  18E-  18F-
  19A-  19B-  19C-  19D-  19E-  19F+
  20A+  20B+  20C+  20D+  20E-  20F+
  21A+  21B-  21C+  21D+  21E+  21F+
  22A+  22B+  22C+  22D+  22E-  22F-
  23A-  23B+  23C+  23D+  23E+  23F+
  24A+  24B+  24C+  24D+  24E+  24F*
  25A+  25B+  25C-  25D-  25E+  25F+
  26A-  26B-  26C-  26D-  26E-  26F-
Total seats: 150
Total available seats: 80
```

Figure 4: Assigned Seat Map (the assigned seat 24F is marked with *): console output

```
Flight Management Menu
[1] To view all bookings
[2] To search a booking
[3] To view available seats
[4] To assign seat for a booking
[5] To display assigned seat map
[6] To exit
Enter your selection:
```

Figure 5: Flight Management Menu