



ATILIM UNIVERSITY

Department of Computer Engineering

CMPE 114 Computer Programming – II

2021-2022 SPRING

Assignment II – Two Dimensional Arrays

Due Date: May 1st 2022, Sunday 23:59

Write a C program that manages a parking lot with the given specifications below.

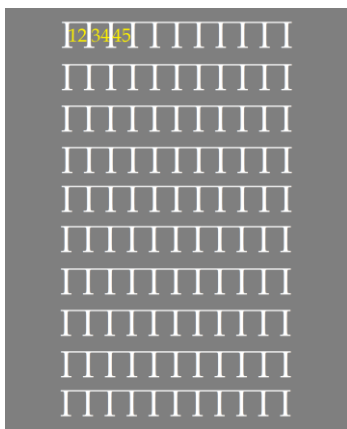


Fig 2: Example Parking

You are running a free parking service. The parking lot is a 10 x 10 matrix with each parking space corresponding to a spot on the matrix. The top left parking spot is [0][0] in the parking lot and the bottom right is [9][9]. See **Figure 1**. Cars will enter from [0][0] and leave from [9][9]. When entering the parking lot, each car takes a ticket. Cars will park on the first empty spot they find. To show that a car has parked in the parking lot you will need to write their ticket number to the appropriate spot in the parking lot matrix. See **Figure 2** where cars with tickets 12, 34 and 45 have already parked. Cars can take the same ticket numbers.

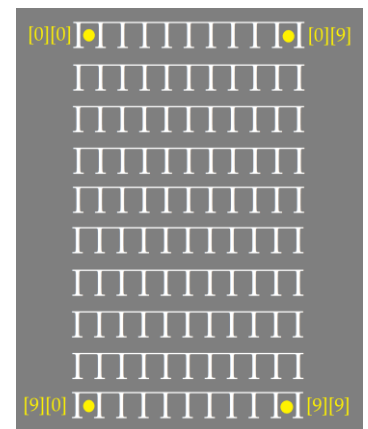


Fig 1: Parking Lot

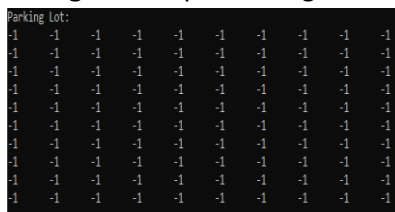


Fig 3: Empty Parking Lot

All empty parking spots should have '-1' value. See **Figure 3** which is an output image.

Your code will start asking for an integer input for commands.

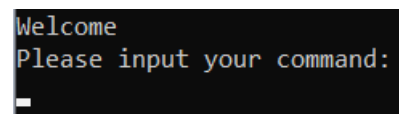
Command '0': Exit the program. You should print out the last state of the parking lot as you exit.

Command '1': Print out the current state of the parking lot.

Command '2': A new car will enter the parking lot. After this command you need to ask for an input for a new ticket number. The new car will take this ticket and park.

Command '3': A car will leave the parking lot. After this command you need to ask for an input for an existing ticket number. You should find the car with that ticket number and empty its parking spot. If no car with that ticket number is found, you should print out an appropriate message and ask for a new command input (not a new ticket input). If there are more than one car with the same ticket, cars should leave in the reverse order that they came.

You can see how your code should output with the examples below. Note that a different set of samples will be used for testing and grading.



Ex. 1: The start of the code

```

Welcome
Please input your command:
2
A new car is entering. Please input a ticket number:
1
Please input your command:
4
Incorrect command, new command needed. Please input your command:
2
A new car is entering. Please input a ticket number:
3
Please input your command:
1
Parking Lot:
1 3 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1

```

Ex. 2: Car Parking & Print Commands

```

Please input your command:
3
A car is leaving. Please input the ticket number of the leaving car:
1
Please input your command:
0
Goodbye. Here is the final Parking Lot:
-1 3 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
-1 -1 -1 -1 -1 -1 -1 -1 -1 -1
Process returned 0 (0x0) execution time : 23.265 s
Press any key to continue.

```

Ex. 3: Car Leaving & Exit Commands

Notes on Grading:

Your homework will be graded out of 100.

- Establish a two dimensional array for the parking lot (15 points)
- In your code you should have a function to print out the current state of the parking lot. (15 points)
- You should have a function to park a car (15 points) and another function to have a car leave (15 points).
- The handling of commands is worth 30 points.
- Appropriate comments and readability of your code (such as indentation) is worth 10 points.

Important Notes:

- The name of your homework file should be "yoursurname_name.c"
- You should upload your homework to the Moodle system before the given deadline of **May 1st 2022, Sunday 23:59**.
- **Group study is not allowed. Everyone needs to do their homework as an individual.**
- Cheating will **NOT** be tolerated. If any case of cheating is detected, at any time, **you will get ZERO from your homework and we will initiate a disciplinary act!**
- A software is used to detect the similarities between submitted codes. **If high similarity is detected, then both parties will be graded as 0.**
- **Late submissions will NOT be graded. There will be no extensions.**