

Coding Assignment 6

Your assignment's C file name will be `Code6_XXXXXXXXXX.c` where `XXXXXXXXXX` is your student id. I will refer to this file in the rest of this document as `Code6.c`.

You are creating a program that will sell tickets to seats in a movie theater. You will set up the theater by asking how big the theater is (row and seats per row). You will then ask how many tickets are needed. You will then allow the user to pick seats in your theater. You will determine if the chosen seat is available or already sold. If the seat is already sold, then the user will be prompted to pick a different seat. If the seat is available, then the seat will be sold.

Please watch the videos showing how the program is run before reading the rest of this document. Look over the `Code6_template.c` file also before continuing.

1. Create three `#defines` at the top of the program. They should all be listed together so that the GTA may easily find them and change them for testing. Please use the EXACT words.

```
MAX_ROWS          set to 9
MAX_COLS          set to 9
TICKET_LIMIT      set to 4
```

2. `main()`

Create a `char` 2D array named `MovieTheater` of size `MAX_ROWS` by `MAX_COLS`

Prompt the user for how big the movie theater is. Ask for the number of rows and the seats per row. The user input for number of rows should not be allowed to exceed `MAX_ROWS` and the user input for number of columns should not be allowed to exceed `MAX_COLS`. Prompt the user to enter values until both values are in range. Any messages referring to those maximums should use the `#define` values.

Call function `FillMovieTheater()` to initialize the array to 'O' (letter O – not zero). Pass in the number of rows and seats per row entered by the user. Pass in the ENTIRE array but only INITIALIZE the part that matches the number of rows and columns entered by the user.

Prompt the user for how many tickets to purchase. If user enters 0, then don't proceed. The user should only be allowed to buy a maximum number of tickets (`TICKET_LIMIT`). The user input should not be allowed to exceed that limit. Prompt the user for number of tickets until the entered value is in range (not less than 0 and not greater than `TICKET_LIMIT`). Any messages referring to that limit should use the `#define` value.

While not all tickets have been sold

 Call `PrintSeatMap` (see screenshots for format and required output)

 Prompt the user for a seat choice

 Translate the seat choice (A1, C2, etc) to an array row and array column value. For example, A1 is array row 0 and array column 0.

 If the seat is not inside the theater, print message.

 Else (you have a valid seat choice) if the seat has been sold (call function `IsSeatSold`)

 Else increment the number of tickets sold because ticket was valid and had not been sold

3. `FillMovieTheater`

Return type `void`

Parameters 2D array of seat map, rows, seats

Use a nested `for` loop to set all values of the 2D array to 'O' (letter O – not zero)

Only put 'O's in the part of the array you are using – the rows and seats per row entered by the user.

4. `PrintSeatMap`

Return type `void`

Parameters 2D array of seat map, rows, seats

Print out the movie theater as seen in the sample out. Only print the part of the array you are using – the rows and seats per row entered by the user.

5. `IsSeatSold`

Return type `int`

Parameters 2D array of seat map, row (value and array column

Use your array row and column and look at that element of `MovieTheater` to see if it has a value of 'O' or 'X'. 'O' means it is available and 'X' means it is sold. Return 1 if seat is sold. If the seat is available, mark that seat/array element of `MovieTheater` as sold by setting it to 'X' and return 0.

Notes

The output shown in the assignment (screenshots/videos) is REQUIRED. Your program must create the identical format/message/output. Part of this assignment is learning how to print a formatted 2D array (we went through this process in great detail in class).

Be sure to not only test good values but test what is called "edge values". If your theater has rows A-D and Seats 1-6, then make sure you can buy a ticket at A1, A6, D1 and D6. Make sure in this case that your program catches invalid seats like A7, D7 and E1. Watch video for examples.

Validate that the seat choice is in your movie theater. For example, if your theater has 6 rows and 4 seats per row and the seat choice is G3, then G translates to row 6, column 2. A theater with 6 rows has array row values of 0 through 5 so row 6 would not be in the array; therefore, not a valid seat choice. If a seat choice is valid (row is outside of range or column is outside of range), then prompt the user for a new value. Continue prompting until a seat in your theater is entered.

Sample Output

Good run with no bad inputs

./a.out

How many rows does your movie theater have? (1-9) 9

How many seat are there per row? (1-9) 9

How many tickets would you like to purchase? (limit 4) 2

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6	Seat 7	Seat 8	Seat 9
Row A	0	0	0	0	0	0	0	0	0
Row B	0	0	0	0	0	0	0	0	0
Row C	0	0	0	0	0	0	0	0	0
Row D	0	0	0	0	0	0	0	0	0
Row E	0	0	0	0	0	0	0	0	0
Row F	0	0	0	0	0	0	0	0	0
Row G	0	0	0	0	0	0	0	0	0
Row H	0	0	0	0	0	0	0	0	0
Row I	0	0	0	0	0	0	0	0	0

Enter seat choice by entering the row and seat

Please pick a seat a1

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6	Seat 7	Seat 8	Seat 9
Row A	X	0	0	0	0	0	0	0	0
Row B	0	0	0	0	0	0	0	0	0
Row C	0	0	0	0	0	0	0	0	0
Row D	0	0	0	0	0	0	0	0	0
Row E	0	0	0	0	0	0	0	0	0
Row F	0	0	0	0	0	0	0	0	0
Row G	0	0	0	0	0	0	0	0	0
Row H	0	0	0	0	0	0	0	0	0
Row I	0	0	0	0	0	0	0	0	0

Enter seat choice by entering the row and seat

Please pick a seat i9

Please find your way to your seats using this map...

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6	Seat 7	Seat 8	Seat 9
Row A	X	0	0	0	0	0	0	0	0
Row B	0	0	0	0	0	0	0	0	0
Row C	0	0	0	0	0	0	0	0	0
Row D	0	0	0	0	0	0	0	0	0
Row E	0	0	0	0	0	0	0	0	0
Row F	0	0	0	0	0	0	0	0	0
Row G	0	0	0	0	0	0	0	0	0
Row H	0	0	0	0	0	0	0	0	0
Row I	0	0	0	0	0	0	0	0	X

Enjoy your movie!

Row number and seat number Validation

How many rows does your movie theater have? (1-9) 10

Rows must be between 1 and 9. Please reenter.

How many rows does your movie theater have? (1-9) -1

Rows must be between 1 and 9. Please reenter.

How many rows does your movie theater have? (1-9) 5

How many seat are there per row? (1-9) -1

Columns must be between 1 and 9. Please reenter.

How many seat are there per row? (1-9) 10

Columns must be between 1 and 9. Please reenter.

How many seat are there per row? (1-9) 5

Number of Tickets Validation

How many tickets would you like to purchase? (limit 4) 0

No movie for you!

How many tickets would you like to purchase? (limit 4) -1

This is a special showing - limit of 4 tickets per purchase

How many tickets would you like to purchase? (limit 4) 6

This is a special showing - limit of 4 tickets per purchase

How many tickets would you like to purchase? (limit 4) 3

Picking an already sold seat Validation

./a.out

How many rows does your movie theater have? (1-9) 8

How many seat are there per row? (1-9) 6

How many tickets would you like to purchase? (limit 4) 2

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6
Row A	O	O	O	O	O	O
Row B	O	O	O	O	O	O
Row C	O	O	O	O	O	O
Row D	O	O	O	O	O	O
Row E	O	O	O	O	O	O
Row F	O	O	O	O	O	O
Row G	O	O	O	O	O	O
Row H	O	O	O	O	O	O

Enter seat choice by entering the row and seat

Please pick a seat a1

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6
Row A	X	O	O	O	O	O
Row B	O	O	O	O	O	O
Row C	O	O	O	O	O	O
Row D	O	O	O	O	O	O
Row E	O	O	O	O	O	O
Row F	O	O	O	O	O	O
Row G	O	O	O	O	O	O
Row H	O	O	O	O	O	O

Enter seat choice by entering the row and seat

Please pick a seat A1

Seat A1 is already sold. Pick a different seat.

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6
Row A	X	O	O	O	O	O
Row B	O	O	O	O	O	O
Row C	O	O	O	O	O	O
Row D	O	O	O	O	O	O
Row E	O	O	O	O	O	O
Row F	O	O	O	O	O	O
Row G	O	O	O	O	O	O
Row H	O	O	O	O	O	O

Enter seat choice by entering the row and seat

Please pick a seat A2

Please find your way to your seats using this map...

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5	Seat 6
Row A	X	X	O	O	O	O
Row B	O	O	O	O	O	O
Row C	O	O	O	O	O	O
Row D	O	O	O	O	O	O
Row E	O	O	O	O	O	O
Row F	O	O	O	O	O	O
Row G	O	O	O	O	O	O
Row H	O	O	O	O	O	O

Enjoy your movie!

Picking a seat that is not in the theater Validation

./a.out

How many rows does your movie theater have? (1-9) 5

How many seat are there per row? (1-9) 5

How many tickets would you like to purchase? (limit 4) 2

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5
Row A	O	O	O	O	O
Row B	O	O	O	O	O
Row C	O	O	O	O	O
Row D	O	O	O	O	O
Row E	O	O	O	O	O

Enter seat choice by entering the row and seat

Please pick a seat z1

That seat is not in this theater!!

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5
Row A	O	O	O	O	O
Row B	O	O	O	O	O
Row C	O	O	O	O	O
Row D	O	O	O	O	O
Row E	O	O	O	O	O

Enter seat choice by entering the row and seat

Please pick a seat a6

That seat is not in this theater!!

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5
Row A	O	O	O	O	O
Row B	O	O	O	O	O
Row C	O	O	O	O	O

Row D	O	O	O	O	O
Row E	O	O	O	O	O

Enter seat choice by entering the row and seat
Please pick a seat d3

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5
Row A	O	O	O	O	O
Row B	O	O	O	O	O
Row C	O	O	O	O	O
Row D	O	O	X	O	O
Row E	O	O	O	O	O

Enter seat choice by entering the row and seat
Please pick a seat E4

Please find your way to your seats using this map...

	Seat 1	Seat 2	Seat 3	Seat 4	Seat 5
Row A	O	O	O	O	O
Row B	O	O	O	O	O
Row C	O	O	O	O	O
Row D	O	O	X	O	O
Row E	O	O	O	X	O

Enjoy your movie!