Foundations of Technical Programming Assignment 1

1 x 5 = 5 marks

1 X 7.5 = 7.5 marks

1 X 12.5 = 12.5 marks

Total = 25 marks

It is part of the submission requirement that you will have to demonstrate/explain your work to your tutor, if you are absent/unavailable or fail to demonstrate properly, zero marks will be awarded.

Please note, this is an individual task and it will be checked for plagiarism. All the involved parties will be penalised if any plagiarism is found.

Please visit https://goo.gl/hQ87zq for more details.

Instructions

1. This assignment contains 3 questions (topics from week 1 to 8), Question 1 carries 5 marks, Question 2 carries 7.5 marks and Question 3 carries 12.5 marks.
2. Algorithm / Pseudocode mandatory for each question.
3. Submit one-word document. Use the following format to prepare the word document
   a) Question No
   b) Algorithm / Pseudocode
   c) C program (Copy paste your c program and not the screenshot of the code)
   d) Screenshot of the output
4. Use only .doc, .docx extensions – no other format will be accepted for marking
5. Marks will be given for proper indentation and comments

Qn1. 5 Marks

Train Ticket Reservation System

Using the C programming language, write a program to imitate the train ticket reservation system.

The system will be used by the Ticketing Officer, who will login to the system at 9:00 am and logout at 5:00 pm.

Patrons will approach the ticketing officer to check availability and to book tickets.

The details of the train:

Class	Capacity	Ticket Price – Above 12 years	Special rates
A	30 seats	25$	15$ - Seniors & Children below 12 years
B	60 seats	15$	10$ - Seniors & Children below 12 years
C	90 seats	9$	5$ - Seniors & Children below 12 years
Note: Free ride for children under 3 years.			

Your program should be menu-driven as shown below:

Initial Screen

```
1 - Class A
2 - Class B
3 - Class C
4 - Current Availability
5 - Exit
Enter your option...
```

When option 1/2/3 is selected

```
How many full tickets ...
10
How many concession tickets - Senior and children under 12 and above 3 ...
2
How may kids under 3 years...
3
```

Next Screen

```
How many full tickets ...
10
How many concession tickets - Senior and children under 12 and above 3 ...
2
How may kids under 3 years...
3
Your total tickets price = 280.00


1 - Class A
2 - Class B
3 - Class C
4 - Current Availability
5 - Exit Enter your option...
```

When option 4 is selected

```
Total available
 Class A is 15
 Class B is 60
 Class C is 90


1 - Class A
2 - Class B
3 - Class C
4 - Current Availability
5 - Exit Enter your option...
```

If you try to buy more tickets than available

```
How many full tickets ...
12
How many concession tickets - Senior and children under 12 and above 3 ...
12
How may kids under 3 years...
12



Less tickets available than required ...
 Total available in Class A is 15
 Class B is 60
 Class C is 90


1 - Class A
2 - Class B
3 - Class C
4 - Current Availability
5 - Exit Enter your option...
```

When option 5 is selected

```
Total available
 Class A is 15
 Class B is 60
 Class C is 90
```

and the program stops

Note:

Only one class (A/B/C) tickets can be purchased in a single transaction.

The system is to reset all records each morning.

No need to store amount collected in the system.

Qn2. 7.5 Marks

Use the rand function to produce two positive one-digit integers (0 includes). The program should then prompt the user with a question, such as

How much is Random 1 + Random 2?

User then inputs the answer (Enter -1 to stop). Next, the program checks the user's answer. If it's correct, the program should randomly display any of the following messages

1. Very good!
2. Excellent!
3. Nice work!
4. Keep up the good work!

and ask another addition question.

If the answer is wrong, randomly display any of the following messages

1. No. Please try again.
2. Wrong. Try once more.
3. Don't give up!
4. No. Keep trying

and let the user try the same question repeatedly until the user finally gets it right.

A separate function should be used to generate each new question. This function should be called once when the application begins execution and each time the user answers the question correctly.

(Hint: Use random-number generation to choose a number from 1 to 4 that will be used to select one of the four appropriate responses to each correct or incorrect answer. Use a switch statement to issue the responses.)

Qn3. 12.5 Marks

Develop a cinema ticket reservation system using the C programming language.

The cinema "**Movie Here**" has one cinema hall and following is the seating arrangement

Seat No→ Row ↓	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										
H										

SCREEN

Your program should allow patrons to reserve movie tickets based on the following information

a. Patrons can buy a maximum of 10 tickets in a single transaction. For 10 tickets reservation, your program should allocate a whole single row if available. If a whole row is not available, your program should allocate as many adjoining seats as possible from different rows.
b. By default, your program should reserve the seats from row A seat 1 onwards.
c. Patrons can select their seats if the allocation can be done within a single row and the seats are adjoining.
d. Your system to have the count of available seats at any time
e. All the seats are priced equally at $15

The following are few sample outputs of the proposed system

1 – Reserve Tickets

2 – Show Current Availability

3 – Show Count of Availability

4 – Exit

Please enter your choice

For option -1

Enter how many tickets you wish to reserve?

11 (user input)

Sorry – Maximum 10 tickets can be reserved at a time

For option – 1

Enter how many tickets you wish to reserve?

5

Do you wish the system to allocate the seats for you Y/N?

Y (user input)

Your seats are allocated from A1 to A5

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										
H										

For option – 1

Enter how many tickets you wish to reserve?

10

Do you wish the system to allocate the seats for you Y/N?

N (user input)

Please select the row & seat number that you wish to reserve your seats from

A1 (user input)

Sorry, no allocation can be done. Seats already taken

Do you wish the system to allocate the seats for you Y/N?

N (user input)

Please select the row & seat number that you wish to reserve your seats from

B5 (user input)

Sorry, no allocation can be done. Insufficient seats in the row

Do you wish the system to allocate the seats for you Y/N?

N (user input)

Please select the row & seat number that you wish to reserve your seats from

B1 (user input)

Seats reserved. B1 to B10

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										

E										
F										
G										
H										

For option – 1

Enter how many tickets you wish to reserve?

10

Do you wish the system to allocate the seats for you Y/N?

Y (user input)

Your seats are allocated from C1 to C10

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										
H										

For option – 1

Enter how many tickets you wish to reserve?

3

Do you wish the system to allocate the seats for you Y/N?

N (user input)

Please select the row & seat number that you wish to reserve your seats from

F8 (user input)

Seats reserved. F8 to F10

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										
H										

For option – 2

Current Availability

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										
H										

For option – 3

52 seats are available for reservation.

Note: It is not required to show the seat reservation and availability in colours. You can use your own approach to show the results.