Question 1: Compose a C++ program to check if a year is leap year or not. If a year is divisible by 4 then it is leap year, however if the entered year is a century year like 2000, 1900, 2100 then it must be distinct by 400.

Question 2: Write a program that accepts three non-negative integers from the user and print true if two or more of them (Integers) have the same rightmost digit.
E.g.
Input the first number: 5
Input the second number: 10
Input the third number: 15
The result is: true

Question 3: You have started working at a water plant and have been asked to develop a program which can calculate the total water consumption bill. Your C++ program will input the number of gallons from the user and will calculate the total bill according to the following conditions:

1. The first 100 gallons for $0.45/gallon
2. The next 250 gallons for $0.85/gallon
3. The next 250 gallons for $1.45/gallon

For additional gallons above 600 $2.60/gallon
An additional service charge of 14% is also added to the bill.
Your answer should be correct to 2 decimal places.

Question 4: Compose a C++ program that takes the order from the user and calculate the bill accordingly. System should also add some discount on the respective bill that exceeds the limit of the payment. The discount should be added according to the following table:

Within 1000	5%
1000 - 1500	10%
1500 - 2000	15%
2000 - 2500	20%
2500 - 3000	30%
Above 3000	50%

You are required to display the Menu of the restaurant as follows.

*************welcome to our menu****************

Press 0 to select TAKEAWAY
press 1 to select DINE IN
press 2 to select DELIVERY

which category you want to choose: 0

***********welcome to takeaway menu**************

_____PRESS 0 FOR BURGER_____
_____PRESS 1 FOR PARATHA ROLL _____

_____PRESS 2 FOR PAKISTANI FOOD _____

which category you want to choose: 0
Select burger type:

1) Mack_____699
2) Zinger_____599
3) Hot_____449
4) Patty Burger_____699

which category you want to choose: 1
Select paratha roll type:

1) platter_____299
2) cheese_____349
3) crispy_____399
4) double trouble_____699

which category you want to choose: 2
Select Pakistani food type:

1) Haleem_____199
2) Nihaari_____199
3) Daal_____149
4) Ghosht_____249

Note: The menu is same for Dine in and delivery.

Display the total bill and adjust the discounted value.

Question 5: Tomorrow is the event of 23 March because of Pakistan day. You are wanting to go to see Parade in Islamabad but this place/Park is at an extensive distance so you will check tickets availability on the web.

You are required to create a Ticket Booking System of Parade where you will enter the quantity of the people going, hours the people will remain there and the swings children were going to choose. Furthermore:

The ticket rates for Park

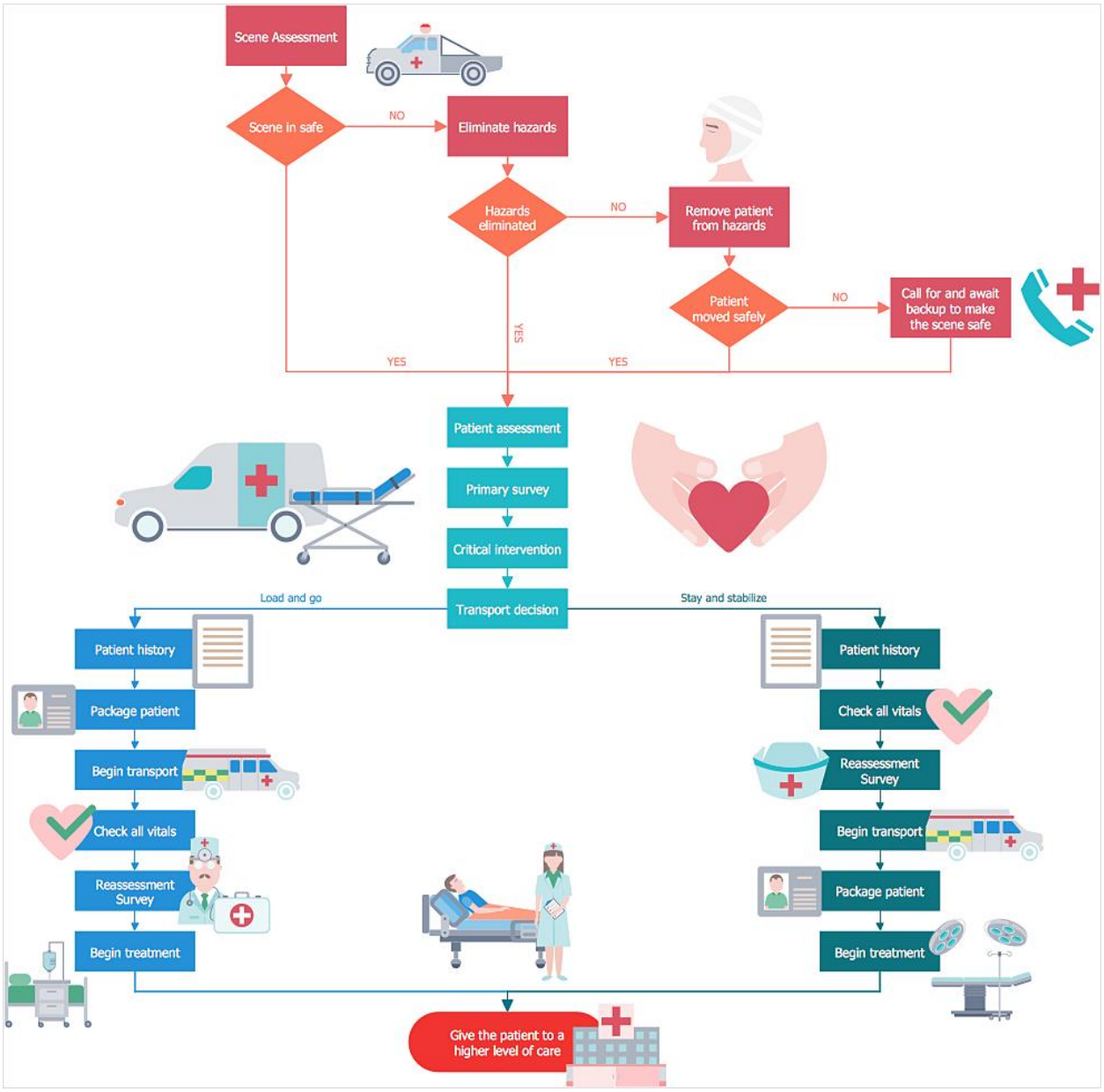
- children under 10 are not permitted to sit on Park
- 10-15(age) wins 10 % OFF
- 15-20 5% OFF

*Above 20 are not allowed
The rates for Park swings

- 1-5 (age) wins 50 % OFF
- 5-10 25% OFF

*Above 10 are not allowed
Program will at that point request to enter age of individual. The next part of program will at that point tell/Display you the sum due after every individual's age you enter park ticket fee which is 10 Rupees per hour.
Note: cost of ticket is PKR 100

Question 6: Write a C++ program that implements the following healthcare management workflow. Your program should lead a person through the steps to help patients.
Here is an example of the program's output (following one of the flows):



Is the scene safe? (Y or N): **N**
Eliminating hazard
Is hazard eliminated? (Y or N): **Y**
assessing the patient
conducting primary survey
providing critical intervention
Is the patient stable now? (Y or N)? **N**
take patient history

Pulling insurance details
transport
checking vitals
reassessing patient's condition
treating
handing patient over to higher level of care

Question 7: Given below is a table where each ID has a role assigned to it and a password, corresponding to that ID:

ID	Role	Password
100	student	10220
101	student	16010
102	student	11002
103	student	22342
104	student	44323
105	student	33354
106	student	87685
107	student	99089
108	student	34562
109	student	44255
110	teacher	32415
111	teacher	90784
112	teacher	78685
113	IT staff	15254
114	IT staff	81973

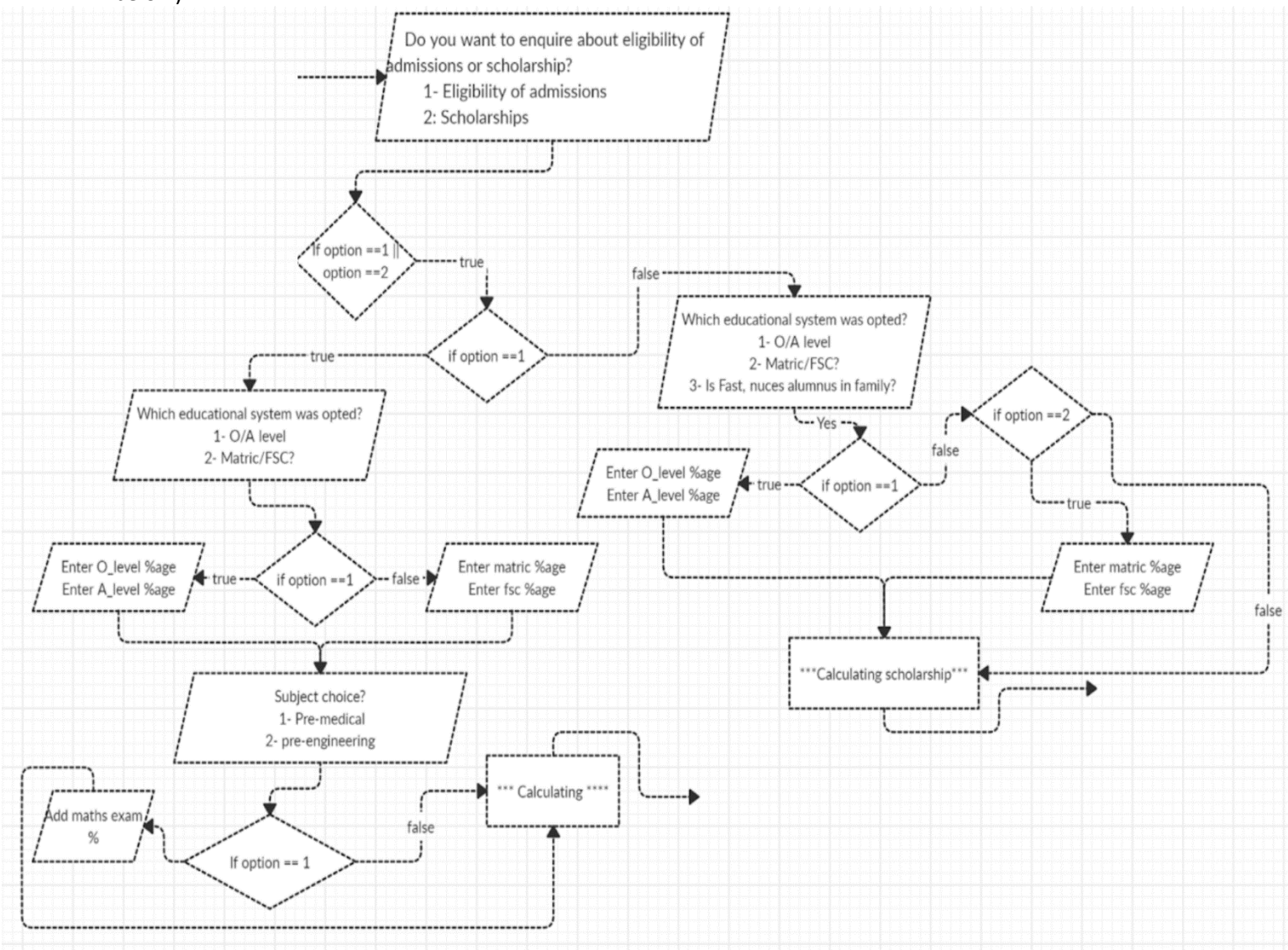
Write a C++ program that takes ID from the user. Based on the ID determine the role and display appropriate messages to ask the user to enter his/her password (if the role is a student then display "Dear student please enter your password). If the password provided by the user is correct the program will print the greeting message, otherwise, the program will display an error message "You have entered an incorrect value" and the program ends. If the ID does not exist, the program will print Incorrect ID.
This should be done using switch and nested switch only.

Question 8: Admissions office of your university is really overburdened by the questions regarding admission. There are two types of questions that are most frequently being asked by the interested candidates or their guardians.

1. Is a person eligible to apply for FAST-NUCES?
2. Is there any scholarship offered by the University?

You have been assigned to make software for your university's admissions office, which has to be deployed on some PCs. Interested people (candidate or guardian) can use your software to determine the eligibility criteria or the scholarship offered by the university.

See the flowchart below that takes input from the user. If the user wanted to know the eligibility criteria, then appropriate inputs should be taken and output should be a table. (format of the table can be seen below).



	O-level/ matric	**A-level/ FSC**	**Add_maths**	**University admission test**
Distribution	15%	35%	pass	50%
Obtained	x (entered by user)	y (entered by user)	Pass (if scored 50% in add_maths) else fail For pre-engineering students add_maths exam is already set as pass If this is fail->student is not eligible	Determine what percentage from the 50% weightage of the admission test should be achieved to meet the minimum (overall) eligibility criteria of 75% (As evident from the table below). Also, inform how many marks a student needs in the admission test if the total marks are 250.

If the user is eligible for FAST-NUCES display the following table and ask the user to enter a preferred degree and calculate the marks needed in the admissions test to secure a position for the degree.

ID	**Degree**	**Merit**
1	BS Software Eng.	79%
2	BS Computer Sciences	80%
3	BS Artificial intelligence	75%
4	BS Data Sciences	76%
5	BS Cyber Security	77%
6	BS Electrical Engineering	76%

If the user wanted to know about scholarship options, then you follow a different path as shown in the flowchart below. Scholarship is provided based on the following table. Display the following table and output the appropriate message if the individual is eligible for scholarship or not. If he is eligible then how much scholarship could be offered to him/her.

O/A level	90% above - O Level	10%
	90% above - A Level	30%
Matric/FSC	90% above - Matric	10%
	90% above - FSC	30%
Alumnus	Blood relation (sibling, parents)	20%
	Maternal or paternal cousin	10%

If an individual is eligible for more than one scholarship, then display the appropriate message and only the highest %age scholarship will be awarded. For example, if a student scored 95% in matric and 92% in FSC, he/she will be awarded with 30% (i.e. of FSC only).

NOTE:

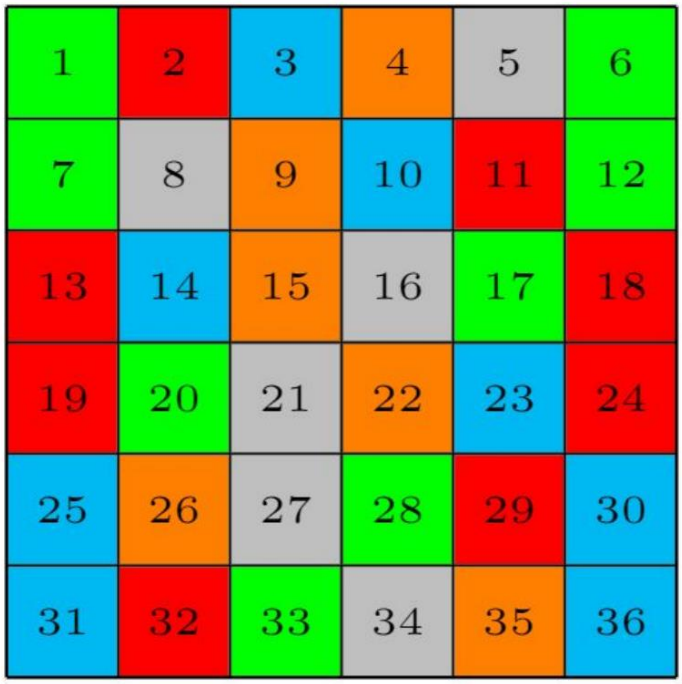
1. Consider the corner cases while programming. What if the user enters any number other than the menu ids, the program should end?
2. Display appropriate messages where needed. Keep in mind you have to make a software to assist the user.
3. Display appropriate table with correct format and styling.

BONUS: Students will be rewarded with bonus points if he/she takes obtained marks and total marks as input from the user, instead of %ages for FSC, Matric, O-level, A-level.

Question 9: You are given a grid as shown in the figure below. You can determine the color and number of each square from the grid. Write a C++ program that inputs two numbers within the grid range. Your program will determine if the two squares entered in this grid have the same color or not and display the appropriate message, let's call this ROUND1. You then again ask the user to enter two numbers and determine if the two squares have the same color then display a victory message but this time you will have to make sure that does not repeat the numbers entered in the first round. If he does, give him a warning and ask to enter values again (You can give max of 3 warnings, on the fourth warning you will end the program). Total rounds of this guessing game will be 5. In each round you will make sure that the numbers entered does not match with any of the previous victory numbers.

If the user wins at least 3 rounds of this guessing game, then it's a win.

NOTE: You cannot use arrays to store the matrix information.



1. Input: 2 4 // are not equal =>Round1
2. Input: 9 15 //are equal =>Round2
3. Input: 9 15 //WARNING 1 and is not considered as a round3
4. Input: 16 21 //are equal =>Round3
5. Input: 16 21 //WARNING 2 and is not considered as a round4
6. Input: 9 5 //WARNING 3 and is not considered as a round4
7. Input: 29 30 // are not equal =>Round4
8. Input: 9 5 **//WARNING 4 ***END OF PROGRAM*****

Question 10: Welcome to your burger shop!

Write a C++ code to develop a software for your burger shop that takes orders for a tasty burger from the user, in just 5 steps. Attached below is the menu that you are going to display to the user in a nice attractive format. User can only add one type of bun to the burger. Maximum two types of cheese, 1 item from the category "turn up the taste", maximum 3 from fresh'N it up and 3 from the sauces. If the user presses 0 then you are going to skip that category (user cannot skip "choose your bun" and "turn up the taste").

Each element from the "choose your bun" costs .72$
Each element from the "make it cheesy" costs .5$
Each element from the "turn up the taste" costs 1.2$
Each element from the "fresh'N it up" costs .2$
Each element from the "get saucy" costs .3$
After taking the input from the user. Total cost will be displayed for the burger in $.

NOTE: This question should be attempted using switch and nested ifs.

YOUR CREATION create YOUR TASTE *in 5 simple steps*

1. CHOOSE YOUR BUN

TOASTED BRIOCHE STYLE BUN

BAKER'S BUN

NO BUN - LETTUCE WRAP

2. MAKE IT CHEESY

CHEDDAR CHEESE

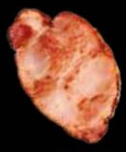
SWISS CHEESE

COLBY JACK CHEESE

McDONALD'S® CLASSIC CHEESE

SHAVED PARMESAN

3. TURN UP THE TASTE



RASHER BACON

CRISPY BACON

EGG

113g ANGUS BEEF PATTY

GUACAMOLE

TORTILLA STRIPS

GRILLED MUSHROOMS

GRILLED PINEAPPLE

4. FRESH'N IT UP

WHOLE LEAF LETTUCE

TOMATO

CARAMELISED GRILLED ONIONS

SLICED BEETROOT

RED ONION

LONG SLICED PICKLE

JALAPEÑOS

5. GET SAUCY

KETCHUP

TOMATO CHILLI JAM

BBQ

DIJONNAISE

BIG MAC® SPECIAL SAUCE

AIOLI

HERB AIOLI

CHIPOTLE MAYO