National University of Computer and Emerging Sciences

Assignment # 01

Programming Fundamentals

Section C & D

Department of Computer Science

Q1) Write an algorithm in which you will take a, b and c as an input where a, b and c are part of the quadratic equation i.e. ax^2 + bx + c, and tell whether the roots of the quadratic equation are equal, unequal or imaginary.

Hint: Google the word "Discriminant".

Q2) Write an algorithm and draw its flow chart in which you will input first character of your name in variable char of type character, and show whether it is a vowel or not.

Example: If my name is "Hamza" so here char='H' and it is not a vowel, if the name is "Iqbal" then yes it is a vowel.

Q3) You have 5 variables. Your task is to take an integer as input from user and to check whether the entered integer exists in the variables. Print appropriate message after searching.

Q4) Write a pseudocode to Swap two variables without using a variable.

Q5) Write a pseudocode to Find the biggest of three Numbers.

Q6) Draw a Flow Chart from the following algorithm in the fig below.

```
Simulate the flipping of the coin

If user picked heads, and the coin flip was heads
        Print "It was heads"
        Print "You win!"

If user picked heads, and the coin flip was tails
        Print "It was tails"
        Print "You lose!"

If user picked tails, and the coin flip was tails
        Print "It was tails"
        Print "You win!"

If user picked tails, and the coin flip was heads
        Print "It was tails"
        Print "You lose!"
```

Q7)

Create a pseudocode algorithm for the motion of an elevator. Lets keep it simple:

- Begin the algorithm immediately after a button for a floor is pressed (in other words, the destination floor is one of the inputs). We can assume no other buttons have been pressed. The algorithm should be kept very general. It should work for any destination floor and any starting floor. **Do not assume a certain destination or starting floor.**
- The algorithm needs to check if the elevator needs to travel up floors, down floors, or just remain on the same floor.
- For each floor it travels to, it should check if someone is waiting for the elevator (we can use that as the condition). If that condition is true, the elevator doors should open then close. Let us assume that other passengers that get on do not press a button. The elevator is only concerned about getting the initial passenger to the destination floor.
- Once the elevator reaches its destination, the doors open. We can end the algorithm there. Do not worry about anyone else stuck in the elevator.

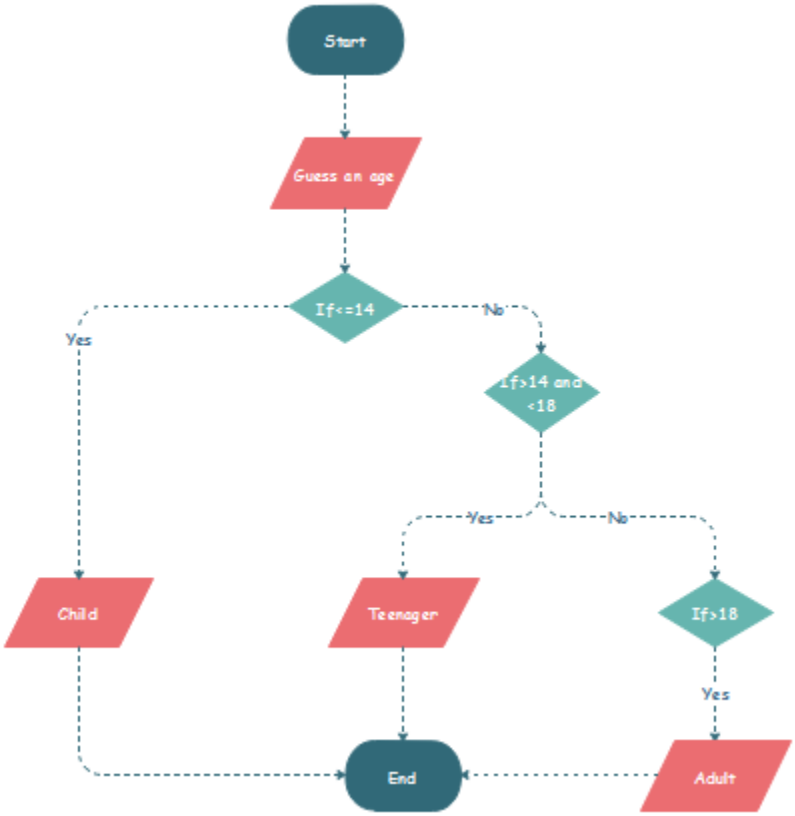
Q8) Draw a Flow Chart from the following algorithm given in the fig. below.

Find the sum of 5 numbers

Algorithm in simple English

1. Initialize sum = 0 and count = 0
2. Enter n
3. Find sum + n and assign it to sum and then increment count by 1
4. Is count < 5
   if YES go to step 2
   else
   Print sum

Q9) Write an algorithm from the flow chart below.



Q10) Write a pseudocode and draw the flow chart below.

I. You have only two bottles. One has capacity of 3 liters and the other has of 5 liters. Your task is to measure 4 liters using these two bottles. **(Note: You have no measuring scale in these bottles)**

II. The program will need to get a letter (A for addition, S for subtraction, M for multiplication, or D for division) and two integers from the user. If the user enters an invalid letter, the program should not ask the user for the two integers. Instead, it should display an appropriate error message before the program ends. **(Note: When subtracting or dividing your program should always subtract/divide lesser number from the greater number)**

III. Read a non-negative integer in a variable and print its HCF.

Bonus Task:

Q) Write a pseudocode which will have one integer input as an n. Your algorithm must show whether this n is a perfect square or not.

For Example: n=64, Yes it is a perfect square (Square of 8).

Guidelines

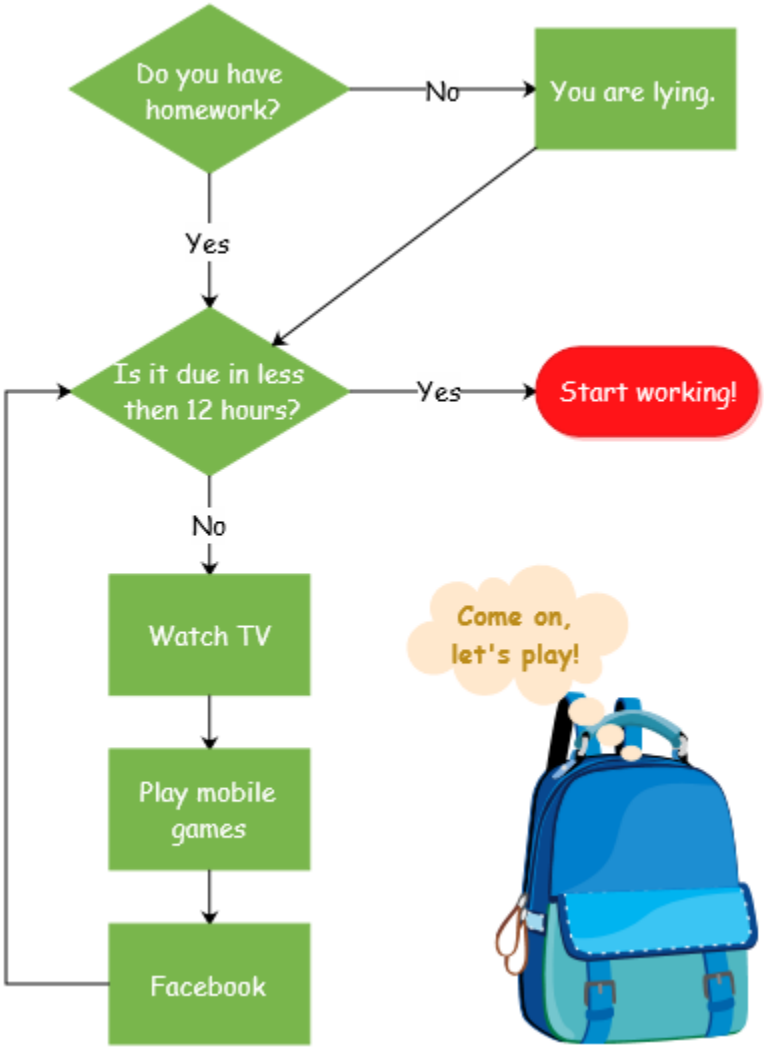
- A single violation of guideline will lead to Zero mark in your assignment.
- You will have maximum marks if you have done the entire task.
- You are encouraged to take help from Internet and books.
- Only hand-written assignment should be submitted, Assignment would not be accepted via email,
- Facebook or USB flash drive etc.
- Deadlines should be kept in mind no extension in assignment dates.
- This is an individual assignment. PLAGARISM IS NOT ACCEPTABLE!
- Follow the instructions as it is, otherwise your assignment would not be accepted at all.

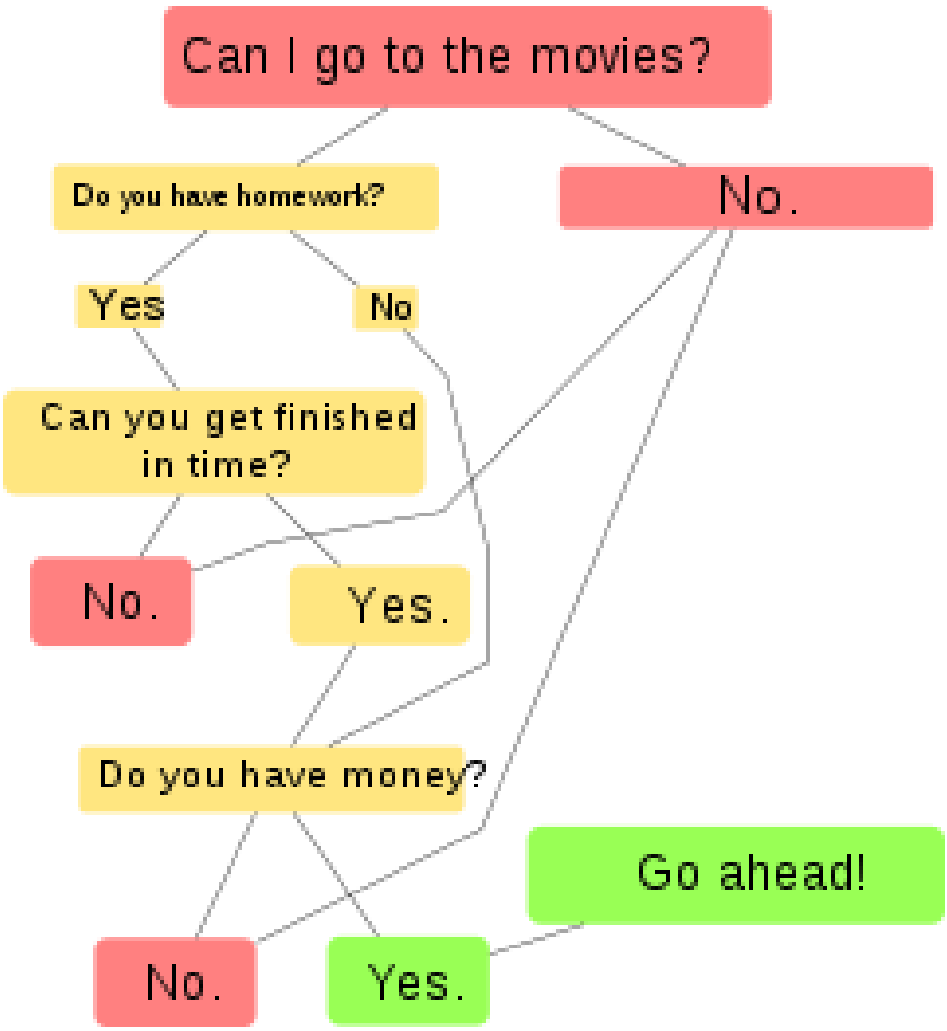
Never doubt what you can do

because you can do anything

you set your mind to.

Some Examples




Can I go to the movies?
Do you have homework?
No.
Yes
No
Can you get finished in time?
No.
Yes.
Do you have money?
Go ahead!
No.
Yes.

Shopping for New Dresses