

## Introduction to Computing – Fall 2012

(BS-SE-F12 Morning & Afternoon)

# Assignment # 2 (Selection-based Flow Charts)

Submission Deadline: **Thursday, 8<sup>th</sup> November, 2012 (till 6:00 PM)**

This page can be taken from the following folder

**\\printsrv\Teacher Data\Aasim Ali\F12-ITC**

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### Instructions

- This is an individual assignment. You are **NOT** allowed to work/submit in form of group. **Absolutely NO** collaboration is allowed. Any traces of plagiarism/cheating may result in an “F” grade in this course.
  - Do **NOT** copy even a single line of code from any other person or book or Internet or any other source.
  - This assignment needs to be submitted in **hand-written form**. See **Submission Procedure** at the end.
  - **Clearly mention your Name, Roll Number and Section on the title page.**
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Draw a separate flowchart for each of the following questions.

1. Output the word “High” if the value of the variable *score* is greater than 100, and “Low” if the value of *score* is at most 100.
2. Get a number from user, if it is negative then display “The number is negative” otherwise, display “The number is non-negative”.
3. Prompt the user for two numbers A & B, then compute  $C=A/B$ , if the number B is non-zero. If B is zero then display “division by Zero” message otherwise display C.
4. Write a program to input age and print if the age is valid enough to have a driving license.
5. Input two positive numbers from user and display the larger of them.
6. Three numbers denoted by the variables A, B and C are supplied as input data. Identify and print the largest one of these numbers.
7. Input four positive numbers from user. Display the smallest of those values.
8. Input three positive numbers from user. Compute and display the average of the two highest numbers.
9. Write a program that takes three numbers and display them into ascending order.
10. Write a program that reads an integer and determines and prints whether it is odd or even. (Special Instruction: Use simple division).
11. Write a program that reads two integers (in any order) and then print either “multiple” or “not” according to whether 2<sup>nd</sup> number is multiple of the 1<sup>st</sup> one or not.
12. Write a program that reads two integers (in any order) and then print either “multiple” or “not” according to whether one of the integer is multiple of other.

13. Write a program that takes two numbers from user and determines that first number is a factor of second number.
14. Calculate pay of an employee based on the hours worked. The input includes the employee total hours worked this week and their hourly pay rate. The employee is to be paid their basic wage for the first 40 hours worked and time-and-a-half (i.e. 50% more) for all hours above 40 (overtime pay). Output the regular pay, overtime pay, and total pay for the week on the screen. If the employee worked 40 hours or less, do not output any information about overtime pay.
15. Prompts the user to enter his/her marks obtained in first semester subjects as well as the credit hours of each subject. You have five subjects of your first semester and you can assume the total marks in each subject to be 100. Compute the grade points (GPTS) and Letter grade of each subject. Finally compute the total grade points, Grade point Average and Letter grade for the entire semester. Also mention that whether the student is on probation or not.
16. Display the absolute of a number input by user.
17. Input an integer value representing the weekday (1, 2, ..., 7), and give the day of the week (Monday, Tuesday, ..., Sunday).
18. Write a program that requests an integer value representing the month of the year and gives the number of days in that month.
19. Write a program that reads a single digit value (0-9) and then prints the number as a literal string. For example, if input is 7, then the output should be word "seven".
20. Write a program that mimics a calculator. The program should take as input two integers and the operation to be performed. It should then output the numbers, the operator, and the result. (For division, if the denominator is zero, output an appropriate message.) Use 1 for Addition, 2 for Subtraction, 3 for Multiplication, and 4 for Division. A sample run follow:

**Sample run:**

```
Enter 1st number : 13
Enter 2nd number: 5
Enter operator: 3
13 * 5 = 65
```

[Hint: Use print before every scan, to show a proper message (prompt) before input.]

21. Write a program that reads operator code and two integers. If the operator code is between 1-6 to map the six relational operators (<, >, <=, >=, ==, !=), then two integers are compared using that operator and a message describing the result is printed.

**Sample run:**

```
!= 33 77
33 is not equal to 77
```

22. Input three values a, b and c and print the roots, if real, of the quadratic equation:

$$ax^2 + bx + c = 0$$

**Sample 1:** if input is a=1, b=1, c=-6 the output should be "Roots of the equation are -3 and 2"

**Sample 2:** if input is a=1, b=0, c=9 the output should be "Sorry! The roots are not real may be imaginary or complex"

23. Input three values a, b and c and print the roots, if real, of the quadratic equation:  $ax^2 + bx + c = 0$ . Display the root if the values of a, b, c do not cause any problem for computation formula.
24. Input x and y coordinates of a point from the user, and display the quadrant where does the point lies. If the quadrant does not occur in any quadrant then display suitable message.
25. Input a number form the user, if it is between 1 and 100, display “In Range” otherwise display “Out of Range”.
26. Input a number form the user, and display whether it is a two-digit number or not. Assume that user inputs a positive number.
27. Input a number form the user, and display the number of digits in that number. Assume that user inputs a positive number less than 10000.
28. Input a number form the user, and store its reverse in another variable. Assume that user inputs a positive number less than 10000. Sample: 3415 => 5143
29. Write an if-else statement that outputs the word “Warning” provided that either the value of the variable temperature is greater than or equal to 100, or the value of the variable pressure is greater than or equal to 200, or both. Otherwise, the if-else statement outputs the work “OK”. The variables temperature and pressure are both of type Integer.
30. Input marks from a user, if marks are greater than 85 display “Excellent”, if the marks are between 80 and 84 (both inclusive) display “Very Good”, if the marks are between 75 and 79 (both inclusive) display “Good”, if the marks are between 70 and 74 (both inclusive) display “Fair”, if the marks are between 65 and 69 (both inclusive) display “Satisfactory”, otherwise display “You may not get the degree with such marks”.

### Submission Procedure

You are required to submit this assignment in hand-written form on any reasonably presentable papers. NO LATE SUBMISSION WILL BE ENTERTAINED FROM NOW ON.

😊 GOOD LUCK! 😊

*Remember: Honesty always gives fruit (no matter how frightening is the consequence apparently); and Dishonesty is always harmful (no matter how charming it may seem in a certain situation)!*