Conditional Problems

1. Ask the user if he/she has a Quiz tomorrow. If the answer is yes, then display "Go and study for the quiz". If the answer is no, then display "Go home and watch TV".

2. Input a number form the user, if it is between 1 and 100, display "In Range" otherwise display "Out of Range"

3. Write an if-else statement that outputs 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. The variable score is of type int.

4. Write a program that gets a number from user, if it is negative then display "The number is negative" otherwise, display "The number is non-negative".

5. Prompt the user for two numbers A & B, computes and displays C=A/B. If the number B is zero, displays a "division by Zero" message.

6. Write a program that reads an integer and determines and prints whether it is odd or even. (Hint: Use the modulus operator).

7. Write a program that will read an alphabet (a, b, c, … , … , … , z or A, B, C, …, …, …, Z) either in small or big caps. Then the program should display the entered character into its reverse form. For example, if user entered an alphabet in small caps that should be converted and display into its equivalent upper case form and vice versa.

8. Write a program that reads two integers (in any order) and then print either "multiple" or "not" according to weather one of the integer is multiple of other.

9. Write a program to input age and print if the age is valid enough to have a NIC card.

10. Prompt the user to enter his/her age. If the age is less than 18 display *"Too young to vote"*. If the age is greater than or equal to 18, ask the user if he has ID card? If yes display *"You can vote"* otherwise display *"You cannot vote without ID card"*

11. Input two positive numbers from user and display the maximum out of them.

12. 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 int.

13. Write a program that reads a character and then prints: "It is a vowel" if it is a vowel (a, e, i, o, u), "It is an operator" if it is one of the five arithmetic operators (+, -, /, *, %), and "It is something else" if it is anything else. Use a ***switch*** statement.

14. Write a program that requests an integer value representing the month of the year and gives the number of days in that month. Use Select Case blocks (ignore leap year).

15. Prompts the user to enter a number representing the month of the year. Display the number of days in the month. (The program should work with input like 1 or January, or jaNuaRy as well).

16. Write a program that inputs a day number of the year and prints month and a day of the month. Assume that the year is not a leap year.

17. Three numbers denoted by the variables A, B and C are supplied as input data. Identify and print the largest one of these numbers.

18. Input three positive numbers from user. Compute and display the average of the two highest numbers.

19. Write a program that take three floating point numbers and display them into ascending and descending order.
    The output should be:
    Enter number 1: 5
    Enter number 2: 7
    Enter number 3: 4
    The ascending order is: 4   5   7
    The descending order is: 7   5   4

20. Write a program that reads in ten whole numbers using a single cin statement. The user can enter them in any order. Your program should not ask the user to enter the positive and negative numbers separately. Finally the program outputs
    - The sum of the numbers that are greater than zero
    - The sum of the numbers that are less than or equal to zero
    - The sum of all the entered numbers

21. Modify the above program using only 4 variables.

22. A palindrome is a number or a text phrase that reads the same backwards as forwards. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a program that takes input a five digit number from user and determine whether it is a palindrome or not. (e.g., if the user enters 28782, the output of the program should be "It's a palindrome". (Hint: use the division and modulus operators to separate the number into its individual digits)

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23. 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".

24. 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.) Some sample outputs follow:
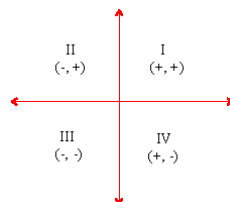
Output should be:

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

25. In a right triangle, the square of the length of one side is equal to the sum of the squares of the lengths of other two sides. Write a program that prompts the user to enter the lengths of three sides of a triangle and then outputs a message indicating whether the triangle is a right triangle.

26. Input three values a, b and c and print the roots, if real, of the quadratic equation: ax2 + bx + c = 0 (<u>Sample Input 1</u>: a=1, b=1, c=-6 the output should be "Roots of the equation are -3 and 2") (<u>Sample Input 2</u>: if the input is a=1, b=0, c=9 the output should be "Sorry! The roots are not real may be imaginary or complex")

27. Consider a quadratic expression, say $x^2 - x - 2$. Describing where this quadratic is positive, involves describing a set of numbers that are either less than the smaller root (which is -1) or greater than the larger root (which is +2). Write a C++ Boolean expression that is true when this formula has positive values.

28. Consider the quadratic expression $x^2 - 4x + 3$. Describing where this quadratic is negative involves describing a set of numbers that are simultaneously greater than the smaller root (+1) and less than the larger root (+3). Write a C++ Boolean expression that is true when the value of this quadratic is negative.

29. Write a program that takes two numbers from user and determines that first number is a factor of second number. [Hint: Use *if–else* and modulus operator]

30. Write a program that takes a point (x, y) from the user and find where does the point lies. The point can lie on any of the following **(you are not allowed to use any of the logical operator &&, || or !)**

   - 1st Quadrant
   - 2nd Quadrant
   - 3rd Quadrant
   - 4th Quadrant

31. Write a program that reads a single char digit (0-9) and then prints the number as a literal string. For example, if input is 7, then the output should be word "seven". Use a switch statement.

32. Write a program that reads two characters and two integers. If the first character or the two characters together form one of the six relational operators (<, >, <=, >=, ==, !=), then two integers are compared using that operator and a message describing the result is printed.

Output should be:

!= 33 77
33 is not equal to 77

33. Write a program that reads a grade, A, B, C, D, E or F and then prints "excellent", "very good", "good", "fair", "poor", or "failure" respectively. Use *if-else* structure

Output should be:

Enter a grade letter: B
good…

34. Rewrite the above program using *switch* statement.

35. Prompts the user to enter his/her marks obtained in first semester subjects as well as the credit hours of each subject. (You can hard code the five subjects of your first semester and you can also hard code 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.

GRADING SYSTEM for Fall 2010 batch

PERCENT MARKS	GRADE POINTS
85-100	4.00
80-84	3.70
75-79	3.30
70-74	3.00
65-69	2.70
61-64	2.30
58-60	2.00
55-57	1.70
50-54	1.00
Below 50	0.00

A student attains **Probation Status** if his/her CGPA becomes **1.70** or more but less than **2.00.**

A sample output can be as given below. But you are free to design as per your design capabilities, I mean better than this.

SEMESTER CGPA CALCULATOR

Subjects	Total Marks	Obtained Mks	Credit Hours	GPTS	Letter Grade

Total Grade Points: _____

Semester GPA: _____

Letter Grade: _____