

DSA Programming Assignment-II

(Conditional Statements & Looping)

1. Any integer is input through the keyboard. Write a C program to find out whether it is an odd number or even number.
2. Given three points (x1, y1), (x2, y2) and (x3, y3), write a C program to check if all the three points fall on one straight line.

Hint: Three points are collinear, if slope of one set of points = slope of other set of points.

3. Any character is entered through the keyboard, write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters ASCII Values

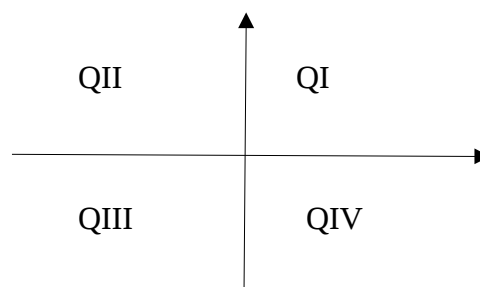
A - Z 65 - 90

a - z 97 - 122

0 - 9 48 - 57

special symbols 0 - 47, 58 - 64, 91 - 96, 123 - 127

4. If the ages of Rahul, Ayush and Ajay are input through the keyboard, write a C program to determine the youngest of the three.
5. Write a C program that takes the x – y coordinates of a point in the Cartesian plane and prints a message telling either an axis on which the point lies or the quadrant in which it is found.



Sample lines of output:

(-1.0, -2.5) is in quadrant III

(0.0, 4.8) is on the y-axis

6. The body mass index (BMI) is commonly used by health and nutrition professionals to estimate human body fat in populations. It is computed by taking the individual's weight (mass) in kilograms and dividing it by the square of their height in meters. i.e.

$$\text{Metric : BMI} = \frac{\text{weight (kg)}}{(\text{height (m)})^2}$$

Then use some if statements to show the category for a given BMI.

<i>BMI</i>	<i>category</i>
<i>less than 18.5</i>	<i>underweight</i>
<i>18.5 to 24.9</i>	<i>normal weight</i>
<i>25.0 to 29.9</i>	<i>overweight</i>
<i>30.0 or more</i>	<i>obese</i>

7. A University conducts a 100 mark exam for its student and grades them as follows. Assigns a grade based on the value of the marks. Write a C program to print the grade according to the mark secured by the student. [Use switch-case]

<i>Mark Range</i>	<i>Letter Grade</i>
<i>>=90</i>	<i>O</i>
<i>>=80 AND <90</i>	<i>A</i>
<i>>=70 AND <80</i>	<i>B</i>
<i>>=60 AND <70</i>	<i>C</i>
<i>>=50 AND <60</i>	<i>D</i>
<i>>=40 AND <50</i>	<i>E</i>
<i><40</i>	<i>F</i>

8. Write a program to read an integer from 1 to 999 and print the integer in words.

***For example, if 437 is read, the output should be:
four hundred and thirty-seven***

9. Write a C program to read integer values for *month* and *year* and print the no of days in the month. For example, 4 1990 (April 1990) should print 30, but 2 1992 (February 1992) should print 29 (A leap year, n, is divisible by 4; however if n is divisible by 100 then it is a leap year only if it is also divisible by 400).

10. Write a C program to convert several temperatures from degree-C to degree-F. The program first requests the number of conversions to be done.

11. Write a C program to input an integer, n, between 1 and 9 and print a line of output consisting of ascending digits from 1 to n, followed by descending digits from n-1 to 1. For example if n=5, produce

123454321

12. Write a C program to read a positive integer N and determine

- (a) Whether or not N is factorial number;
- (b) Whether or not N is prime
- (c) Whether or not N is a perfect square.

13. An integer n is divisible by 9 if the sum of its digits is divisible by 9. Write a C program to display each digit, starting with the rightmost digit.

Your program should also determine whether or not the number is divisible by 9. Test it on the following numbers:

n = 154368

n = 621594

n = 123456

Hint: Use the % operator to get each digit; then use / to remove that digit. So $154368 \% 10$ gives 8 and $154368 / 10$ gives 15436. The next digit extracted should be 6, then 3 and so on.

14. There are 500 light bulbs (numbered 1 to 500) arranged in a row. Initially they are all OFF. Starting with bulb 2, all even numbered bulbs are turned ON. Next, starting with bulb 3, and visiting every third bulb, it is turned ON if it is OFF, and it is turned OFF if it is ON. This procedure is repeated for every fourth bulb, then every fifth bulb, and so on up to the 500th bulb. Write a C program to determine which bulbs are OFF at the end of above exercise.
