C++ Programs

Scope: *Knowing how to construct a program*

1. Write a program to add and subtract two numbers.
2. Write a program to multiply and divide two numbers and print them in the form of equation. For example: Output must be in the format
   4*3=12
   8/4=2
3. Write a program to find the square and cube of a given number.
4. Write a program to find the square root of a given a number (use sqrt() function).
5. Write a program to find the area and perimeter of a square.

Scope: *Making use of language tokens*

6. Write a program to find the area and circumference of a circle.
7. Write a program to find the area of a sphere.
8. Write a program to find the volume of a cylinder.
9. Write a program to find your age in days.
10. Write a program to find the simple interest and compound interest.

Scope: *Usage of various arithmetical operators*

11. Write a program to calculate the total mechanical energy of a particle is given by $e=mgh+1/2mv^2$.
12. Write a program to convert the given seconds into hours-minutes-seconds.
13. A milk vendor buys milk at the rate of 3.25/liter then adds a liter of water for every 4 liters of milk and sells the water milk at the rate of 4.15/liter. Input no. of liters of milk from the consumer and write a program to calculate the gain for milk vendor.
14. The temperature of the city is input through the keyboard in Fahrenheit. Write a program to convert into Celsius.
15. Two numbers are input into two locations 'a' and 'b'. Write a program to interchange the contents of 'a' and 'b' without using temporary variables.
16. Given the coordinates of two points (x_1, y_1) and (x_2, y_2). Write a program to find the distance between these two points.

Scope: *Getting thoroughness with the input and output statements*

17. Rajesh's basic salary is input through the keyboard. His D.A. is 40% of basic salary, and H.R.A. is 20% of basic salary. Write a program to calculate his gross salary.
18. The distance between two cities in Kilometers is input through the keyboard. Write a program to convert and print the result in meters and centimeters.
19. Write a program which accepts the amount in dollars and convert into rupees.
20. Write a program to read your address and print it.
21. Write a program to print the area of triangle if base and height values are given.
22. Write a program to print the area of a triangle if three sides are given.

Scope: *Knowing the usage of conditional statement 'if'*

23. Write a program to read the marks of 3 subjects and display the total and average. And check whether a student is pass or fail.
24. Write a program to check whether the given number is positive or not.
25. Write a program to find out the given number is odd or even.
26. Write a program to find smaller of given two numbers.

Scope: *The usage of conditional statement 'if-else'*

27. Write a program to find biggest of given three numbers.
28. Write a program to check whether the given year is leap year or not.
29. Write a program to find the roots of a given quadratic equation and print the nature of roots.

Scope: *More on conditional statements*

30. Write a program to read positive numbers continuously until negative number is given by using 'if'.
31. Write a program to read ten numbers and print their sum by using 'if' statement.
32. Write a program to read three sides a, b, c of a triangle and print the type of the triangle. Use the following details:-
    Right angle triangle: (a*a)+(b*b)==(c*c) || (b*b)+(c*c)==(a*a) || (c*c)+(a*a)==(b*b)
    Equilateral triangle: (a==b) && (b==c)
    Isosceles triangle: (a==b) || (b==c) || (c==a)
    Scalene Triangle: (a! =b && b! =c && c! =a)

Scope: *Using of 'if-else-if' and 'nested if'*

33. Input Sales price and write a program to calculate the monthly income of a person using the following commission schedule: (using *'if-else-if'* statement).

Monthly sales Income:	**Person's Income**
>=Rs. 50,000	Rs. 375 + 16% sales
<=Rs. 50,000 but >=40,000	Rs. 350 + 14% sales
<=Rs. 40,000 but >=30,000	Rs. 325 + 12% sales
<=Rs. 30,000 but >=20,000	Rs. 300 + 9% sales
<=Rs. 20,000 but >=10,000	Rs. 250 + 5% sales
<=Rs. 10,000	Rs. 200 + 3% sales

34. Write a program to read a 3 digit number and find whether the middle digit is numerically equal to the sum of the other two digits and prints an appropriate response.
35. A company insures its drivers in the following cases
    i. If the driver is married
    ii. If the driver is unmarried, male and above 30 years of age
    iii. If the driver is unmarried, female and above 25 years of age

    In all other cases, the driver is not insured. If the marital status, sex and age of the driver are the inputs, write a program to determine whether the driver is insured or not (use *'nested-if'*)

Scope: *Processing on characters*

36. Write a program to read the characters continuously until *'$'* is given and display the number of characters entered.
37. Write a program to read a character and find out whether it is uppercase or lowercase.
38. Write a program to print the uppercase letter of a given lowercase.

39. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use *'if-else-is'* ladder).
40. Do the above program using switch case.

Scope: *Usage of multiway decision maker*

41. Write a program to read a vowel character and print any appropriate word by using switch case.
42. Write a program to find the biggest number among 2 numbers by using switch case.
43. Write a program to emulate a four function calculator which can perform addition, subtraction, multiplication and division. Program should read two real numbers and an operator which tells the operation to be performed. Do it using switch case.
44. Write a program to read amount and print how many numbers of 2000, 500, 200, 100, 50, 20, 10, 5, 2, 1 notes are available in the given amount.
45. Write a program to accept a date and print it in words.

Scope: *Getting knowledge in iteration*

46. Write a program to read your name and print it 'n' times.
47. Write a program to find whether the given number existing in an array or not.
48. Write a program to find the sum of 'n' natural numbers.
49. Write a program to find the sum of 'n' different numbers.
50. Write a program to find sum of even 'n' natural numbers.

Scope: *Printing numbers in various formats*

51. Write a program to display the numbers sequentially from 1 to 99 with 5 numbers on each line.
52. Write a program to display the numbers sequentially from 1 to 99 with 5 numbers on each column.
53. Write a program to read 9 elements and print the array elements in 3*3 matrix format.
54. Write a program to display the multiplication table for a given number.

Scope: *Getting started to work with arrays*

55. Write a program to find the biggest of the given numbers.
56. Write a program to find the second smallest number and its position among the given 'n' numbers.
57. Write a program to find the total number of +ve numbers and –ve numbers and zeros out of a given 10 real numbers.
58. Write a program to print the numbers which are divisible by both 3 and 7 from 1 to 100.

Scope: *Using of while, for and repeat loops*

59. Write a program to find the given number is prime number or not.
60. Write a program to find the given number is perfect or not.
61. Write a program to find the given number is automorphic or not.
62. Write a program to find the given number is Armstrong or not.
63. Write a program to find the given number is palindrome or not.

Scope: *Usage of modulus (%) and division (/) operators*

64. Write a program to find the sum and product of the individual digits of a given number.
65. Write a program to accept maximum of 6 digits number and find out the sum of even digits of that number and multiplication of odd digits of that number.
66. Write a program to find the number of digits of a given number.
67. Write a program to print the reverse of a given number.

Scope: *More on looping concepts*

68. Write a program to find the factorial of the given number.
69. Write a program to print all prime numbers from 1 to 99.
70. Write a program to print the prime factorial from 1 to 99.
71. Write a program to print Fibonacci series for a given number.

Scope: *Processing on integer numbers using loops*

72. Write a program to find 'n' power 'n' (n^n).
73. Write a program to find 'm' power 'n' (m^n).
74. Write a program to find 'm' power 'n' value without using (*).
75. Write a program to find the G.C.D. of 'n' numbers.
76. Write a program to find the L.C.M. of 'n' numbers.

Scope: *Getting thoroughness with arrays*

77. Write a program to find the second biggest number from the given 'n' numbers.
78. Write a program to find the second biggest, second smallest and replace their positions and then print the array elements.
79. Write a program which reads the names of 5 sales persons into one-dimensional array and their sales figure in each of six months into a two-dimensional array. The program then must print the total sales for each sales person and the grand total for the size months as well.
80. Write a program to display frequency table of an array elements.

Scope: *Various processing on array elements*

81. Write a program to suppress the negative elements into the down positions of an array.
82. Write a program to store 10 elements in an array, find the minimum element in the array and subtract it from each element of the array and display the array elements.
83. Write a program to read 10 elements in an array, keep last 5 elements in the first phase and first 5 elements in the last face without using dummy way.

Scope: *Operation on array elements and exchanging array elements into different positions*

84. Write a program to read 10 elements into an array, find out the zeros from the first element of the array and keep the accumulation of the entire array, wherever zero as occurred.
85. Write a program to read 5 numbers each into two arrays and display the sum of each subset.

    Example: a[0] + b[0] = sum[0]
    a[1] + b[1] = sum[1]
    a[2] + b[2] = sum[2]

Scope: *Conversion of numbers from one base to other*

86. Write a program to convert the given integer into binary and vice versa.
87. Write a program to convert the given integer into octal.
88. Write a program to convert the given integer into hexadecimal.

Scope: *Various operations on numbers*

89. Write a program to find the positional value of the given digit in a number. If the given digit is occurred in various positions, then print all positional values.
90. Write a program to print the given number in words.

Scope: *Operation on numbers such as sorting and conversion*

91. Write a program to sort the elements in ascending order.
92. Write a program to sort the elements in descending order.
93. Write a program to convert the given number in Roman letter.

Scope: *More operations on numbers*

94. Write a program to print the ASCII values of numbers from 0 to 255.
95. Write a program to print the multiples of a given number up to 200.
96. Write a program to find the mean, variance and standard deviation of the given 'n' numbers.

Scope: *Printing numbers in triangle patterns*

97. Write a program to print the Floyd's triangle

    1
    2 3
    4 5 6
    7 8 9 10

98. Write a program to print the following triangle

    1
    1 2
    1 2 3
    1 2 3 4
    1 2 3 4 5

99. Write a program to print the following triangle

    1
    2 2
    3 3 3
    4 4 4 4
    5 5 5 5 5

100. Write a program to print the following triangle

    1
    1 1
    1 2 1
    1 2 3 1
    1 2 3 4 1
    1 2 3 4 5 1