List of Practicals CSHP – 101
S/W Lab based on CSHT 101
Programming Fundamentals – C++

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the n terms of the following series

   S = 1 + 1/2 + 1/3 + 1/4 + ...
4. WAP to compute the n terms of the following series

   S = 1 - 2 + 3 - 4 + ...
5. WAP using iteration
   a) Display Fibonacci Series
   b) Calculate Factorial of a number.
   c) Calculate GCD of two numbers.
6. Write a function to find whether a given no. is Prime or not. Use the same to generate prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. WAP to print the triangle of stars as follows (take number of lines from user)

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    *
   ***
  *****
 *******
```

9. Write a function that checks whether a given string is a Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
10. Write a menu driven program to perform following operations on strings (using String class functions):
    a) Concatenate two strings
    b) Compare two strings.
    c) Calculate the length of the string
    d) Convert all lowercase characters to uppercase.
    e) Convert all uppercase characters to lowercase.
    f) Calculate the number of vowels.
    g) Find a substring in a given string.
11. WAP to perform following actions on an array entered by the user:
    a) Print the even-valued elements.

b) Print the odd-valued elements.

c) Calculate and print the sum and average of the elements of user.

d) Print the maximum and minimum elements of array.

e) Remove the duplicates from the array.

f) Print the array in reverse order.

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter and to quit the program.

12. Create Matrix class. Write a menu driven program to perform following Matrix operations (2-D array implementation) :

    a) Sum

    b) Difference

    c) Product

    d) Transpose

13. WAP that prints a table indicating the number of occurences of each alphabet in the text entered as command line arguments.

14. WAP that swaps two numbers using pointers.

15. Create a file that contains records of 5 employees. Each record contains an employee's salary details. Print the information retrieved from the filw in the following format:

    EId Name Basic HRA DA Extra Allowances

16. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file. Write a program to retreive the student information from file created in previous question and print it in following format.

    Roll No. Name Marks

17. Copy the contents of one text file to another file, after removing all whitespaces.

18. Create a class Triangle. Include overloded functions for calculating area. Overload assignment operator and equality operator.

19. To the above class Box add the following functions:

    a) Calculate Volume

    b) Overload + operator (to add two boxes length, breadth and height)

    c) Overload operator = = (to check equality of two boxes), as a friend function

    d) Overload Assignment operator

    e) Check if its a cube or cuboid

20. Create a class Length containing feet and inch. Include following functions

    a) Input Length object

    b) Overload +operator (to add two lengths)

c) Overload - operator (to subtract two lengths)

d) Display Length object

WAP which takes input from user for feet and inch to test the above class.

21. Create a class Person. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain respective information in the classes and create, display and delete objects of these two classes. (Use Run Time Polymorphism).

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(for B.sc.(H) Comp. Sc. only)

22. To the class Box (created in Q 19) add overloaded constructors to enable the creation of a Box without passing any arguments, creation of a cube with a single argument, and a cuboid with three arguments.

23. To the class Box (created in Q 19) add a copy constructor that provides for initialising a Box using another Box.

24. Create a class Location with data members latitude and longitude. Overload operator + using friend functions to enable incrementing the latitude and longitude by a given integer. Demonstrate that ob+100 and 100+ob are both valid.

25. In the above class Location , implement the prefix and postfix versions of increment and decrement operators.