Laboratory Manual

FOR

Problem solving using C Programming Lab

(MCA-153)

MASTER OF COMPUTER APPLICATIONS

REGULAR PROGRAMME

Offered by

Indira Gandhi Delhi Technical University for Women

(Established by Govt. of Delhi vide Act 09 of 2012)

(Formerly Indira Gandhi Institute of Technology)

Kashmere Gate Delhi-110006

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Guidelines

1. Students are allowed to work in groups of n ($1 \leq n \leq 6$) since some of the exercises are complex.

2. Any of the programming language can be used.

3. Every lab exercise should include objective, language used , details of protocol (background, history, drawbacks , etc.)

4. Both algorithm and properly commented program alongwith screenshots of output are to be written in files.

5. A proper explanation of the program is to be presented to the instructor as well as the class.

6. Every student is required to come prepared with the algorithmic steps of the lab exercise.

7. Study Material to be referenced from standard books, internet, published papers etc.

8. All references to be mentioned properly with each lab exercise.

9. Any student found indulged in malpractices, disobedience will be debarred from the lab without any warning for a part/whole semester.

List of Experiments

1. Write a program to print 'Hello World' on the screen.
2. Write a program to read an integer input from the user and print the same.
3. Write a program to take two integer inputs and output their sum as the result.
4. Write a program to swap two integers without using a third variable.
5. Write a program to swap two integers with using a third variable.
6. Write a program illustrating the garbage values of uninitialized variable.
7. Write program(s) to perform following conversions (and vice-versa)
   a) Temperature in Celsius to Fahrenheit
   b) Height in Centimeters to Feet
8. Write a program to read an input key stroke (alphabet, numeric or special symbol) and output its equivalent ASCII code.
9. A n digit number is input by the user, write a program that calculates the sum of all the digits of the number.
10. Write a program that calculates simple interest given the rate of interest, principal amount and duration (years and months).
11. Write a program to add, subtract, divide and multiply two given numbers and return the corresponding outputs. What will happen if denominator in division is zero?
12. Write a program that takes an integer input and outputs whether it is even or not.
13. Write a program that takes a year as input and outputs whether it is leap year or not.
14. Write a program that takes coefficients of a quadratic equation as input and outputs the roots of the quadratic equation.
15. Write a program to find greatest of the three input integers.
16. Write a program that takes as input an alphabet and outputs whether it is a consonant or a vowel, use switch statement.
17. Given the x and y coordinates of the center of circle and radius of circle, write a program that takes the x and y coordinates of a point as input and outputs whether point lies inside, outside or on the circle.
18. Write a menu-driven program (using switch statement) that takes two input integers and performs addition, subtraction, division and multiplication based on the menu option selected by the user.
19. Illustrate with a program where goto statement can be used.
20. Write a program to print table (first ten multiples) of a given number.
21. Write a program to find factorial of a given number.
22. Write a program to find sum of digits of a given number with any number of digits (within the range of integer).
23. Write a program to find reverse of a given number.
24. Write program(s) to convert a given decimal number into its binary form and vice-versa.
25. Write a program to find H.C.F. of a given number.
26. Write a program to find sum of following series:1+ 1/2 + 1/3 + ….. +1/n
27. Write a program to find sum of a geometric series, assume input data from user.
28. Write a program to find whether a given number is prime or not.
29. Write a program to print the Fibonacci series.
30. Word size of the computer refers to the number of bytes that can be stored in a single memory location. Write a program to find word size of the computer.
31. Write a program to illustrate working of pointer to pointer.
32. Write programs to illustrate pointer arithmetic for different types of pointers.

33. Write a program to find size of various types of pointers (int, float, char)? What are the factors on which size depends?
34. Write a program to input a string and display the same as output.
35. Write a program to calculate length of a string.
36. Write a program to compare two strings.
37. Write a program to copy one string into another.
38. Write a program to reverse a given input string.
39. Write a program to concatenate a string into another string.
40. Write program(s) to illustrate for various types of storage classes.
41. Write a program that calculates area of a circle using PI as macro.
42. Illustrate pointer to structure using a program.
43. Write a function that takes two end points of line segment as input and returns its slope and mid-point.
44. Write a program to read a text file as input and count number of characters, words and lines in the file.
45. Write a program to copy a source text file into a target text file.
46. Write a program to read and write a file using following combinations of functions:
    a) fgetc( ) and fputc( )
    b) fprintf( ) and fscanf( )
    c) fgets( ) and fputs( )
    d) fread( ) and fwrite( )

Rules to be followed

Do's

1. Strictly adhere to submission **deadline.**
2. **Both sides** of the paper to be used for print outs of lab files.
3. Standard font face and size to be used. (Times New Roman (14) for heading , 12 for text, `Courier(11) for code.`
4. Any sort of plagiarism is not accepted.
5. Every student to appear before viva-voce on the date scheduled for internal assessment.
6. Complete the lab work assigned in the lab timings only.
7. All references to be mentioned properly with each lab exercise.

Don'ts

1. Late submission – Marks will be deducted from internal assessment.
2. Plagiarism – is Unacceptable.
3. Malpractices, cheating**,** disobedience, misbehavior etc.-these activites are unacceptable and any student found indulged will be debarred from the lab without any warning for a part/whole semester.
4. Mobile Phone -- Use of mobile phone is strictly prohibited in the lab.

Evaluation Policy

1. Students will be evaluated on the basis of their performance in laboratory.
2. Each lab exercise will be evaluated on the following basis :

   a) Implementation

   b) Timely submission

   c) Presentation of code.

   d) Viva

3. Marks will be deducted from internal assessment for any delay, plagiarism, mis-conduct etc.