Umesh

Advanced College of Engineering & Management
Computer Programming Lab Manual

Lab sheet One

Title: Basics of Computer Programming

Objectives:

- To be familiar with syntax and structure of C-programming.
- To learn problem solving techniques using C

Lab exercises (please code yourself and show the output to instructor):

1. Write a program to display "hello world" in C.
2. Write a program to add two numbers (5&7) and display its sum.
3. Write a program to multiply two numbers (10&8) and display its product.
4. Write a program to calculate area of a circle having its radius (r=5).
5. Write a program to calculate area of an ellipse having its axes (minor=4cm, major=6cm).
6. Write a program to calculate simple interest for a given P=4000, T=2, R=5.5. (I = P*T*R/100)

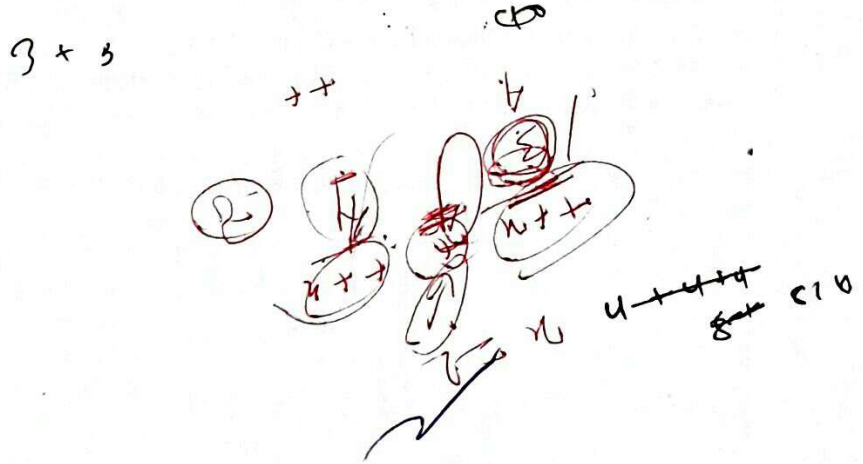
Lab Sheet Two

Title: Introduction to data types, operators and expression

Objectives :

- To be familiar with data types, operators and expressions in C

1. Write a C program to prompt the user to input 3 digit number and print these values in forward and reversed order.
2. Write a program to swap two variables values with and without using third variables
3. Write a program to check odd or even number (a) using modulus operator (b) using conditional operator.
4. Print the value of y for given x=2 & z=4 and analyze the output.
   a. y = x++ + ++x; b. y= ++x + ++x; c. y= ++x + ++x + ++x;
   d. y = x>z; e. y= x>z? x:z; f. y = x&z;
   g. y= x>>2 + z<<1;
5. Write a program to print the size of char, float, double and long double data types in C.
6. Write a program to find given number is palindrome or not.
7. Write a program to find given number is armstrong or not.



Lab Sheet Three

Title : Introduction to Branching Statements

Objectives :

- To be familiar with branching/control statements in C programming

1. Write a program to convert a given character from lowercase to uppercase and vice versa.
2. Write a program to print roots of a quadratic equation (both real and imaginary).
3. Write a program to check whether a year is leap year or not.
4. Write a program that reads two numbers and an arithmetic operator (+, -, *, /, %) and perform the operation as per the operator supplied using switch case.
5. Write a program to produce the output as shown below:

x	y	expressions	results
6	3	x=y+3	x=6
6	3	x=y-2	x=1
6	3	x=y*5	x=15
6	3	x=x/y	x=2
6	3	x=x%y	x=0

6. Given x=3.0, y=12.5, z= 523.3, A=300.0, B=1200.5, C=5300.3, Write a program to display the following:

```
X    y    z=    3.0|  12.5|  523.3|
A    B    C=  300.0| 1200.5| 5300.3|
-------------------------------------------------------------
X    y    z=  |3.00   |12.50    |523.30
A    B    C=  |300.00 |1200.50  |52300.30
```

Lab Sheet Four

Title: Introduction to looping techniques in C programming

Objectives:

- To learn about looping techniques.

1. Write a program that asks a number and test the number whether it is multiple of 5 or not, divisible by 7 but not by eleven.
2. Write a program to generate and print all the prime numbers between the range specified by users.
3. Write a program to generate first n Fibonacci numbers.
4. Write a program to calculate HCF and LCM of two integers provided by users.
5. Write a program to read set of numbers until user wants and calculate and print their maximum and minimum values.
6. Write a program to calculate and print the terms of following series up to nth terms.

-10 -12 -14 -18 -26 -42 -74 ....

$t_1 = -10$

$t_2 = -12$

$t_3 = t_2 \times 2 - 10$

$t_4 = t_2 \times 2 - 10$

$-14 \times 2 + 10$

Lab Sheet Five

Title : User defined function and recursive functions

Objectives :

- To learn about user defined functions and recursive function.

1. Write a program to add, subtract, multiply and divide two integers using user defined type function with return type.
2. Write a program to check whether an integer is prime or not using user defined function.
3. Write a program to print all the palindrome numbers between the range entered by user using user defined function.
4. Write a program to convert decimal numbers into it equivalent binary numbers using user defined function.
5. Write a program to calculate factorial of given number using recursive function
6. Write a recursive function to generate Fibonacci series.

Lab Sheet Six

Title : Array handling techniques in C programming

Objectives :

- To understand programming using different dimensions of Array.

1. Write a program to enter 10 floating numbers in an array and display it.
2. Write a program to initialize one dimensional array of size 8 and display the sum and average of array elements.
3. WAP to read list of numbers, sort them in ascending orders and print the sorted list.
4. WAP to read list of numbers using function read(), sort them in ascending order using function sort() and display the sorted list using function display().
5. WAP to read square matrix and print the same matrix by replacing its diagonal elements by minimum value among the elements of original matrix.

Lab Sheet Seven

Title : String handling techniques in C programming

Objectives :

- To understand programming with String and string handling functions

1. Write a program to copy one string to another string without using string handling functions.
2. Write a program to concatenate two string using user defined functions concatenate() without using string handling functions.
3. Write a program to read a sentence and count the number of characters &words in that sentence.
4. Write a program to read a list of words, arrange them in dictionary order and print the ordered list using function Read(), Arrange() and Display() respectively.
5. Write a program to read a sentence and reprint the same sentence by replacing all the occurrence of the substring "the " by "***".

Lab Sheet Eight

Title : Pointers in C programming

Objectives :

- To understand programming with Pointer and Function call by reference.

1. Write a program to find the sum of all the elements of an array using pointers.
2. Write a program to ask list of numbers from users, sort them and display sorted list using pointer.
3. Write a program to find biggest among three numbers using pointer.
4. Write a program that calls reverse_array() to reverse the array and return array and display the elements of reversed array using Pointer .
5. Write a program to read two numbers and swap their values using pass by reference method.

Lab Sheet Nine

Title : Structures in C programming

Objectives :

- To understand programming with Structure.

1. Create a structure named company which has name, address, phone and noOfEmployee as member variables. Read name of company, its address, phone and noOfEmployee. Finally display these members' value.
2. Write a program to create a structure named employee , which has name, address , phone as member variables and sort the structure on the basis of employee name in ascending order and display the results.
3. Display the results of question number 2 using user defined functions such as read(), sort() and display() respectively.
4. Define a structure "complex" (typedef) to read two complex numbers and perform addition, subtraction of these two complex numbers and display the result.
5. Write a program to create structure "Time" with members hrs, min and sec. Read current time and previous time using structure and display the difference between current time and previous time.

Lab Sheet Ten

Title : File handling techniques in C programming.

Objectives :

- To understand data files and file handling in C.

1. Write characters into a file "filec.txt". The set of characters are read form the keyboard until an enter key is pressed (use putc() and getc() function).
2. Write a program to write name , roll number and age of 5 students in to a disk file name "STUDENT.DAT".
3. Write a program to input and save record like name , roll, address and obtained marks of 48 students in a binary file and search and display the record of a student whose obtained marks is highest. The information should be organized in a structure.
4. Write a program to read the details of book authors write it to file until user wants then read and display nth record in a file where n is read from the user. The data for authors must be represented by structures that contain name, nationality and number of book published.