LAB MANUAL

Programming for Problem Solving

Rajiv Gandhi University of Knowledge Technologies

<div align="center">Week 1</div>

Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment

<div align="center">Week 2</div>

Tutorial 2: Variable types and type conversions:

Lab 2: Simple computational problems using arithmetic expressions

1. Write a C program to find the area of a circle using the formula:
   Area = PI * r2
2. Write a C program to find the area and volume of sphere.
   Formulas are: Area =4*PI*R*R Volume = 4/3*PI*R*R*R.
3. Write a C program to convert centigrade into   Fahrenheit.
   Formula: C= (F-32)/1.8.
4. Write a C program to read in two integers and   display one as a
   percentage of the other. Typically your output should look like
   20 is 50.00% of 40 assuming that the input numbers where 20 and
   40. Display the percentage correct to 2 decimal places.

<div align="center">**Week 3**</div>

Tutorial 3: Branching and logical expressions:

Lab 3: Problems involving if-then-else structures

1. Write a C program to find the maximum from given three nos.
2. Write a C program to find that the accepted no is Negative,
   Positive or Zero.
3. Write a program which reads two integer values. If the first is
   lesser print the message **"up"**. If the second is lesser, print the
   message **"down"** if they are equal, print the message **"equal"** if
   there is an error reading the data, print a message containing the
   word **"Error".**

4. Write a C program that prints the given three integers in ascending order using if – else.
5. Given as input three integers representing a date as day, month, year, print the number day, month and year for the next day's date. Typical input: "28 2 1992" Typical output: "Date following 28:02:1992 is 29:02:1992"

Week 4 & 5

Tutorial 4: Loops, while and for loops:
 Lab 4: Iterative problems e.g., sum of series
1. Write a C program to find the sum of first 100 odd nos. and even nos.
2. Write a C program to display first 100 prime nos.
3. Write a C program to read in a three digit number produce following output
    (Assuming that the input is 347) 3 hundreds, 4 tens, 7 units
4. Write a C program to display Fibonacci series
5. Write a C program to calculate the following
    i.sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!+………,
    ii.sum=x-x3/3!+x5/5!........................,
    iii.sum=1+x/1!+x^2/2!+x^3/3!..............,
6. Write a C program to find the roots of a Quadratic equation.

Week 6

Tutorial 5: 1D Arrays: searching, sorting:
 Lab 5: 1D Array manipulation
1. C program that reads N integer numbers and arrange them in ascending order using Bubble Sort
2. C program that reads N integer numbers and arrange them in ascending order using Merge Sort
3. C program that reads N integer numbers and arrange them in ascending order using Quick Sort

Week 7

Tutorial 6: 2D arrays and Strings

       Lab 6: Matrix problems, String operations
1. Write a C program to perform the basic Matrix operations
    i) Addition ii) Subtraction iii) Multiplication   iv) Transpose.
2. Write a C program to determine if the given string is a palindrome or not
3. Write a C program to count the lines, words and characters in a given text

Week 8

Tutorial 7: Functions, call by value:
Lab 7: Simple functions
    1.   Write a C Function for the following task
        i)   Calculating Factorial
        ii)   Find value of a given Fibonacci term
        iii)   Swapping the values of two variable
    2.   Write a C program that uses functions to perform the following operations:
        i)   To insert a sub-string in to a given main string from a given position.
        ii)   To delete n Characters from a given position in a given string.

Week 9

Tutorial 10: Recursion, structure of recursive calls

Lab 10: Recursive functions

1) Write the following recursive C Function
        i) Factorial of a given number

ii) Nth Fibonacci number
iii)   Reverse of a given String
iv) Reverse of a give Number

Week8

Tutorial 11: Pointers, structures and dynamic memory allocation
Lab 11: Pointers and structures

1. Write a C program to maintain a record of "n" student details using an array of structures with four fields (Roll number, Name, Marks, and Grade). Assume appropriate data type for each field. Print the marks of the student, given the student name as input.
2. Define structure called cricket that will describe the information player name, team name,batting aveg.Using cricket ,declare an array player with 10 elements and write program to read information about all 10 players and print team wise list containing names of the player with their batting avg
3. Write a program using pointers to compute the sum of all elements sorted in an array
4. Write a program to print the elements of a structure using pointers.

Week9

Tutorial 12: File handling:

Lab 12: File operations

1. Write a C program that creates an Employee text file? Records Are empid, empname, designation, qualification, salary, experience, Research work, address, city phone?

2. Write a C program that manipulates the above text file. The program must implements the operation to modify a record, delete a record and append new records