CAP1008:C PROGRAMMING

L:3 T:0 P:2 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: define various data types and apply them to develop simple data processing applications.

CO2 :: understand the fundamental concepts of the C programming language and apply them to solve basic programming problems

CO3 :: apply algorithms and flowcharts to design solutions for computational and real-world problems.

CO4 :: analyze problems and develop efficient C programs using structured programming techniques.

Unit I

Introduction to Programming : introduction to programming, program concept., characteristics of programming, stages in program development., algorithms, notations, flowchart, types of programming methodologies, top down and bottom up program development cycle with case study

Unit II

Principles of programming : C program structure, character set, identifiers and keywords, constants and variables, data types, unformatted and formatted i/o functions- printf(), scanf(), puts (), gets(), getchar(), putchar(), expressions, arithmetic operators, unary operator, relational operator, logical operator., assignment and conditional operator, bitwise operators, type conversion and type modifiers

Unit III

Control Statements and Decision Making : introduction of control statement, condition statements, if, if-else, nested if and switch statement, looping statements-while and do-while loop, for loop, break and continue statements, goto statement

Unit IV

Functions : function definition, predefined functions and user defined functions, scope rules - local and global scope, basics of pointers: pointer declaration, initialization, accessing values using pointers, passing arguments by value and passing arguments by address, recursion., library functions

Unit V

Introduction to Arrays : declaring arrays in C, defining and processing 1d and 2d arrays, array applications: sorting and searching, character arrays, declaration and initialization of string, string handling functions, structure and union: declaration, definition and initialization.

Unit VI

File Handling : categories of files, opening and closing files, text and binary files, reading and writing in files

List of Practicals / Experiments:

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- Program to install and configure the Code::Blocks IDE, create a C project, and execute a simple C program.
- Program to design an algorithm and draw a flowchart for a given computational problem.
- Program to demonstrate the use of formatted and unformatted input/output functions along with arithmetic, relational, logical, and bitwise operators.
- Program to calculate the electricity bill and determine the greatest among three numbers using appropriate decision-making statements.
- Program to generate the multiplication table, factorial, and Fibonacci series using different looping constructs.
- Program to develop a menu-driven calculator using the switch statement.
- Program to demonstrate the use of user-defined functions, library functions, and parameter passing by value and by address.
- Program to compute the factorial and Fibonacci sequence using recursion.

- Program to perform searching and sorting operations on a one-dimensional array.
- Program to perform matrix addition, subtraction, and multiplication using two-dimensional arrays.
- Program to perform string operations such as length, copy, concatenation, comparison, and reversal without using built-in functions.
- Program to demonstrate pointer operations, including swapping two numbers and accessing array elements using pointers.
- Program to maintain student information using structures and demonstrate the use of unions.
- Program to create, read, update, and append records in text files using file handling functions.

Text Books:

1. C: THE COMPLETE REFERENCE by SCHILDT AND HERBERT, MC GRAW HILL

References:

1. PROGRAMMING IN ANSI C by E. BALAGURUSAMY, MC GRAW HILL