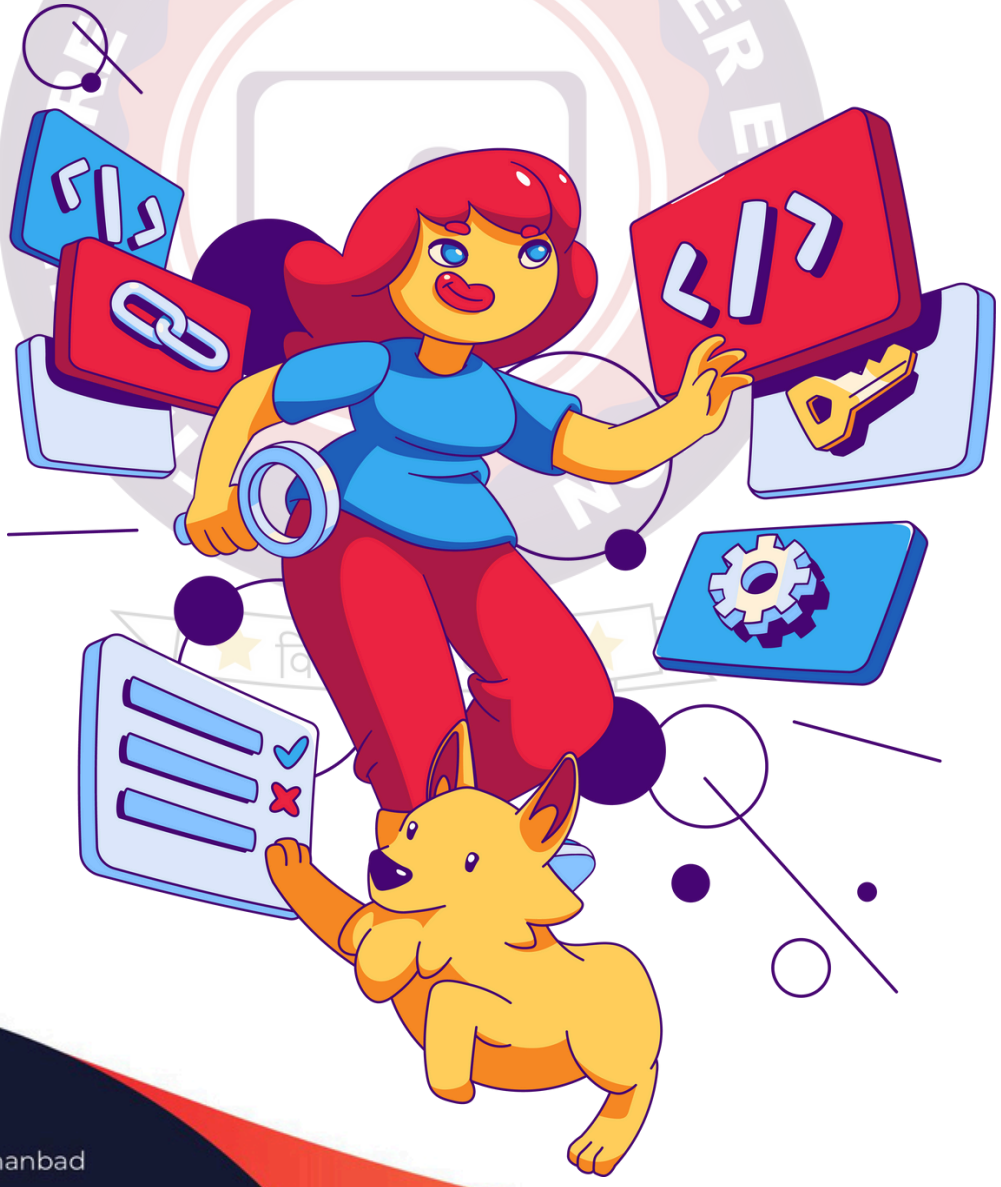
THE FUTURE TRACK

COMPUTER EDUCATION

Course



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C PROGRAMMING

INTRODUCTION TO C

- Overview of C language
- History and applications of C
- Installing a C compiler
- Writing your first C program
- Compilation and execution process

C BASIC SYNTAX

- Structure of a C program
- Keywords and Identifiers
- Comments in C
- Formatting your code
- Input and Output functions (printf, scanf)

C DATA TYPES

- Primitive data types: int, float, char, double, void
- Derived data types: arrays, pointers, structures, unions
- Type qualifiers: const, volatile
- Type modifiers: short, long, signed, unsigned

C VARIABLE TYPES

- Declaring variables
- Scope and lifetime of variables (local, global, static, automatic)
- Constants vs Variables
- Best practices for variable naming

C CONSTANTS AND LITERALS

- Defining constants using #define and const
- Types of literals: integer, float, character, string literals
- Escape sequences and their usage

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C PROGRAMMING

C OPERATORS

- Arithmetic operators: +, -, *, /, %
- Relational operators: ==, !=, >, <, >=, <=
- Logical operators: &&, ||, !
- Bitwise operators: &, |, ^, <<, >>
- Assignment and compound assignment operators
- Increment (++) and Decrement (--) operators
- Operator precedence and associativity

C LOOPS

- for loop
- while loop
- do-while loop
- Nesting of loops
- break and continue statements
- Loop control using goto

C DECISION MAKING

- if, else, else-if ladder
- Nested if
- switch statement
- Conditional (?:) operator

C FUNCTIONS

- Function declaration and definition
- Function arguments (by value and by reference)
- Returning values from functions
- Recursive functions
- Scope and lifetime of functions
- Inline functions

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C PROGRAMMING

C ARRAYS

- Declaration and initialization of arrays
- Single-dimensional and multi-dimensional arrays
- Passing arrays to functions
- Array manipulation (insertion, deletion, traversal)

C STRINGS

- Declaring and initializing strings
- String handling functions (from <string.h>)
- Input and output of strings
- String manipulation (concatenation, comparison, length, copy, etc.)

C POINTERS

- Introduction to pointers
- Pointer arithmetic
- Pointers and arrays
- Pointers to functions
- Pointers to structures
- Dynamic memory allocation (malloc, calloc, free)

C DATA STRUCTURES

- Structures: definition and usage
- Unions
- Enum
- Linked Lists: creation, insertion, deletion, traversal
- Stacks and Queues
- Trees (basic introduction)

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