



Embedded Systems, Advanced C

Introduction to C language

- Features of C
- History
- Structure of C Program.
- Keywords, Identifiers, Variables and Constants

Data Types

- Primitive Data Types.
- Aggregated Data Types.

Operators

- Binary Operators
- Unary Operators
- Ternary Operators
- Special Operators
- Order of evaluation.

Preprocessor features

Functions

- Role of Functions
- Passing arguments to functions
- Returning values from functions
- Recursive Functions
- Callback functions
- Implications on Stack
- Pass by value/reference

Arrays

- Defining, initializing and using arrays
- Multi Dimensional arrays
- Arrays of Characters and Strings
- Arrays and pointers
- Passing arrays to functions
- String handling and its library functions

Storage Classes

- Scope and lifetime of a variable
- Internal
- External/Global
- Automatic
- Static
- Register
- Volatile

Structures & Unions

- Usage of Structures
- Declaration, initialization and accessing
- Nested Structures



- Array of structures
- Allocation of memory and holes
- Unions

Bitwise Operators

- AND (&), OR (|), XOR (^)
- Compliment (~)
- Left-shift (<<), Right-shift (>>)
- Masking, Setting and Testing of Bit/Bits

Pointers

- The purpose of pointers
- Defining pointers
- The & and * operators
- Pointer assignment
- Pointers with functions
- Pointer to Pointer
- Pointers to Arrays
- Arrays of Pointers
- Void Pointers
- Call By value and Call by reference
- Advanced pointer types
- Pointers to functions
- Pointers and Strings
- Pointers and Dynamic memory

Command line arguments

Dynamic Memory Allocation

- Allocation (Malloc, Calloc, Realloc)
- De-Allocation(Free)

Variable Number of Arguments

- Implementation of printf()
- Implementation of scanf()
- **Data Structures**
- Introduction
- Linked Lists
- Stacks & Queues
- Stacks Using Arrays
- Stacks Using Linked List
- Queues using Arrays
- Queues using Linked List.
- Circular Queues
- Single Linked List
- Circular Linked List
- Double Linked List
- Infix, Prefix and Postfix
- Expressions
- Trees



- Binary Trees
- Binary Search Trees
- Graphs
- Hashing

Sorting and Searching Techniques

- Insertion sort
- Selection sort
- Bubble sort
- Merge sort
- Quick sort
- Heap sort
- Linear search
- Binary search

File Handling Concepts

- Concept of a FILE data type
- File Input, Output operations
- Sequential Files
- Random Access Files

Standard I/O Library Functions

- fopen, fread, fwrite, fclose, fseek
- Relationship between file descriptor and FILE pointer
- Character at a time I/O
- Line at a time I/O
- Formatted I/O

Reading and Writing Structures to Files

- In Ascii format
- In Binary format
- Modifying a structure in the file

Development Tools & utilities:

- Linux commands useful in development
- Vi editor
- GCC compiler
- Four Stages of GCC
- Functionality of Preprocessor
- Functionality of Compiler
- Functionality of Assembler
- Functionality of Linker
- Interrupting the Compiler
- Compiling a C Program
- Preprocessor Features
- Predefined Preprocessor Symbols
- Warnings and Extensions
- Optimization
- GDB debugger
- Archive Utility
- Make Utility



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- Object File format
- Executable File Format

Operating Systems Concepts:

- Learning of operating system
- concepts will help you in understanding
- Desktop, Embedded & Realtime
- Operating Systems easily in less
- time.
- Introduction
- Processes
- Threads
- CPU Scheduling
- Process Synchronization
- Deadlocks
- Memory management
- Virtual Memory.
- File management & Disk management

Introduction to Embedded Systems:

- Programmer's view of hardware
- CPU
- Types of CPUs
- CPU Characteristics
- CPU Bus/Machine Cycles
- Memory
- Memory types
- CPU Memory interface
- I/O
- I/O controllers
- CPU I/O interface
- I/O methods/techniques
- Polled I/O or Programmed I/O
- Interrupt Support
- DMA Support

Development Environment:

- Host-Target Environment
- Cross compilers
- Downloading methods
- Serial, Ethernet, Floppy, ROM
- Emulators
- Target based debugging
- Debug Monitors
- Host based source level debugging

ARM (32-bit) Processor Architecture

- Interrupting the Compiler
- Compiling a C Program



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For any further details please email to info@testalogix.com