C++ Basic Foundations Outlines

Basic Syntax and Concepts

- ❖ Hello World Program
- ❖ Data Types and Variables
- ❖ Operators
  (Arithmetic, Relational, Logical)
- ❖ Input and Output
- ❖ cin, cout
- ❖ File I/O

Control Flow

- ❖ Conditional Statements
- ❖ if, else, else if
- ❖ switch
- ❖ Loops
- ❖ for
- ❖ while
- ❖ do-while
- ❖ Break and Continue Statements

Functions

- ❖ Defining and Calling Functions
- ❖ Function Parameters and Return Types
- ❖ Function Overloading
- ❖ Inline Functions
- ❖ Recursion

Arrays and Strings

- ❖ One-dimensional Arrays
- ❖ Multi-dimensional Arrays
- ❖ String Handling
- ❖ C-style Strings
- ❖ std::string Class

Pointers and References

❖ Pointer Basics
❖ Pointer Arithmetic
❖ Pointers and Arrays
❖ Pointers to Pointers
❖ Dynamic Memory Allocation
❖ new and delete
❖ References
❖ Lvalue and Rvalue References

File Handling

❖ Reading and Writing Files
❖ File Streams
❖ ifstream, ofstream, fstream
❖ Binary File I/O

Concurrency and Multithreading

❖ Introduction to Multithreading
❖ Thread Management
❖ Mutex and Lock
❖ Thread Synchronization