

KARACHI EDU COACHING CENTER • COMPUTER SCIENCE CLASS X

Basics of Programming in C++

Comprehensive Chapter Notes • Syntax, IDE Environments, Data Types & Operators

What is a Computer Program & Syntax?



Computer Program

Set of instructions guiding computer hardware to execute specific tasks efficiently.



Programming Syntax

Strict grammatical rules and keywords defining valid code structure for compilers.

Classification of Programming Languages

Low-Level Language

Machine binary (0/1) and Assembly.
Direct hardware access, not portable.

Middle-Level Language

Bridge between hardware control and user interaction. Mostly obsolete.

High-Level Language

English-like syntax (C++, Python).
Portable, machine-independent.

Programming Translators

Compiler

Translates entire high-level source code at once, generating an executable file.

Interpreter

Translates and executes high-level source code line-by-line without creating executables.

Assembler

Converts low-level assembly language mnemonic codes into raw machine code.

Types of Programming Errors

Syntax Error

Violation of grammar rules. Caught by compiler during build phase (e.g., missing semicolon).

Run-Time Error

Occurs during execution, causing sudden crash (e.g., division by zero).

Logic Error

Flaw in algorithm design. Program runs successfully but produces incorrect output.

Components of an IDE

Source Code Editor

Provides syntax highlighting and code completion features for efficient typing.

Compiler & Linker

Automates translation to machine code and links required standard libraries.

Debugger

Allows step-by-step code inspection and variable tracking to locate bugs.

Reserved Words & Data Types

Reserved Words

Predefined keywords with special meaning to the compiler (e.g., `int`, `float`, `while`). Cannot be used as variable names.

Standard Data Types

Defines memory allocation size and value format:

- **int:** 4 bytes
- **float:** 4 bytes
- **char:** 1 byte
- **bool:** 1 byte

Constants vs. Variables

Constants

Fixed values that cannot alter during execution (e.g., literal constants or defined via `const` / `#define`).

Variables

Named memory locations whose stored values can be modified dynamically during program execution.

Variable Declaration & Initialization

Naming Rules & Syntax

Names must begin with a letter or underscore, are case-sensitive, and cannot contain spaces or special symbols.

```
data_type variable_name = value;  
// Example: int score = 95;
```

Chapter 2 Review Complete

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