



Școala
informală
de IT

C++ Development Curriculum

Școala Informală de IT



Cuprins

1. Development Environment
2. Build process
3. SDP
4. Algorithms
5. C++
6. Unit Testing
7. UML
8. Design patterns
9. Coding style
10. Best practices
11. Interview Preparation



1. Development Environment

1.1. Source Version Control

- git
 - What is it?
 - How to use it?

1.2. CMake

1.3. Compiler

- GCC
- Microsoft compiler (Visual Studio)

1.4. Debugger

- GDB
- Microsoft debugger (Visual Studio)

1.5. IDE

1.6. Environment Setup

2. Build process

2.1. Compiling

2.2. Linking

3. SDP

3.1. Analysis

3.2. Design



3.3. Implementation

3.4. Testing

3.5. Maintenance & support

4. Algorithms

4.1. Pseudocode

4.2. Flow chart

4.3. Data structures

- Structure
- Vector
- List (single, double)
- Stack
- Queue

5. C++

5.1. History

5.2. Basic Facilities

- Data types
- Constants
- Variables
- Pointers and references
- Structure, unions and enumerations
- Type casting



- Statements
- Expressions
- lvalue & rvalue
- Functions
 - Pass by value
 - Pass by reference/address
- Exception handling
- Namespaces
- Memory Management (C/C++)
 - Automatic
 - Static
 - Dynamic
- Classes
 - Construction
 - Cleanup
 - Copy
 - Move
 - Operators
- Callable objects
 - Function Objects (functors)
 - lambda
- OOP Concepts
 - Composition
 - Aggregation



- Association
- Inheritance
- Overloading
- Overriding
- Polymorphism
 - Static
 - Dynamic
- Generic Programming
 - Templates
 - Function template
 - Class template
- STL
 - Containers
 - Iterators
 - Algorithms
 - String
 - I/O Streams
 - Regular expressions
 - Smart pointers
- Concurrency
 - Thread and tasks
 - Synchronization of shared resources (through mutex, semaphore)



6. Unit Testing

6.1. Basic Concepts

6.2. Example (based on google framework)

7. UML

7.1. Basics

8. Design patterns

8.1. Singleton

8.2. Class Factory

9. Coding style

10. Best practices

(through all sections)

11. Interview Preparation

11.1. How to present yourself during an IT interview

11.2. CV preparing tips

11.3. General tips