



Module 40

Partha Pratim
Das

Objectives &
Outline

Course
Summary

Key Take-back

Prepare for
Examination

Road Forward

Summary

Module 40: Programming C++

Closing Comments

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Module Objectives

Module 40

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- Review C++ Course
- Information for Examination
- What next?



Module Outline

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- Course Summary
- Key Take-back
- Prepare for Examination
- Road Forward



What we covered

Module 40

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- **Programming in C++ is Fun:** Build and execute a C programs in C++, Write equivalent programs in C++
- **C++ as Better C:** Procedural Extensions of C
- **Object-Oriented Programming in C++:** Classes, Encapsulation, Overloading, friend, static, and namespace
- **Inheritance:** Generalization / Specialization of Object Modeling in C++
- **Polymorphism:** Static and Dynamic Binding, Virtual Function Table, Multiple Inheritance
- **Type Casting:** Cast Operators
- **Exceptions:** Error Handling in C & C++
- **Templates:** Generic Programming in C++



What we did not cover?

Module 40

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Course
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Prepare for
Examination

Road Forward

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- **Functors:** Function Objects
- **STL:** Standard Template Library of C++
- **Resource Management:** Smart Pointers, Memory Handling
- **C++ Coding Styles:** How to write good code?
- **Design Patterns:** Reusable Designs
- **Mixing C and C++:** Smart Pointers, Memory Handling
- **Source Code Management:** How to organize files, libraries?
- **C++ Tools:** Analysis, Version Control etc.
- ...



What have we learnt?

Module 40

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Course
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- C++ is multi-paradigm
 - Procedural: Better C
 - Object-Oriented: Encapsulation, Inheritance, and Polymorphism
 - Generic: Templates
- Reuse is Key
 - Macros
 - Library functions
 - Function Overloading (Static Polymorphism)
 - Inheritance & Dynamic Polymorphism
 - Templates & STL
 - Design Patterns
- Designing good data types is a key for good programming in C++
- While programming in C++, we should keep an eye on:
 - Efficiency
 - Safety
 - Clarity

Do not write C-style programs using C++ compiler



Prepare for Examination

Module 40

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Course
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- Watch the Videos
- Revise the Assignments and Solutions
- Practice lots and lots of coding with every feature
- Design and implement complete data types – Complex, Fraction, Vector, Matrix, Polynomial etc.
- Study Books, try examples
 - The C++ Programming Language by Bjarne Stroustrup
 - Effective C++ & More Effective C++ by Scott Meyers



Road Forward

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Course Summary

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Prepare for Examination

Road Forward

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- Learn the topics not covered
- Breathe programming – regularly code and implement systems
- Read lots and lots of programs by good coders
- Learn Python / Java
- Study **Object Oriented Analysis and Design**
- Study **Unified Modeling Language**
- Study **Software Engineering**
- Study Books
 - The C++ Programming Language by Bjarne Stroustrup
 - Effective C++ & More Effective C++ by Scott Meyers
 - Exceptional C++ & More Exceptional C++ by Herb Sutter
 - Modern C++ Design by Andrei Alexandrescu
 - Design Patterns: Elements of Reusable Object-Oriented Software by Erich Gamma, Richard Helm, Ralph Johnson, & John Vlissides
 - Learning UML 2.0 – A Pragmatic Introduction to UML by Russ Miles & Kim Hamilton (O'Reilly)



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Course
Summary

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Examination

Road Forward

Summary

- Course on C++ concluded



Instructor and TAs

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Outline

Course
Summary

Key Take-back

Prepare for
Examination

Road Forward

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