Contemporary C++: Learning Modern C++ in a Modern Way

الماس فناوری ابری پاسارگاد- آلفا

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Agenda (1/3)

- Getting started: The pre-history of C++: C and Simula - Why C++ or If C++ is the answer, what was the question? - …
- Fundamental concepts: types – expressions – statements – pointers – references – functions - procedural programming, constants, inline, Compile, Link and Execute chain, Stream I/O - user-defined types: struct, enumerations
- Low hanging fruits of Modern C++: Autos – Nullptr - Range-based for loop - Scoped enumeration – Lambdas - …
- Stl: the STL architecture – Containers, Algorithms and Iterators - standard array - vector – string - generic algorithms – vector as an advanced data structure – Predicates: Function objects and Lambda functions - …
- Modularity: The physical structure of a typical C++ program – Linkage – C Preprocessor - component in C++

Agenda (2/3)

- Classes: Fundamental types vs. User-defined types – Data members – Member functions – Access controls: public and private – Special member functions: Construction, Destruction, Copy and Move – Objects – Const objects and const member functions – the mutable keyword – static data members and static member functions - Classes vs. Structs – the explicit keyword – class Invariant – Concrete classes – Handle Classes- RAII - …
- Overloaded operators: Operator functions, Subscription and function call operators – Function objects – Three-way comparison operators – User-defined literals - …
- Namespace and exceptions: The logical structure of a typical C++ program - using declarations and directives - static_assert – noexcept - …
- Free store: The C Memory model - The structure of a typical C++ program in an Operating System - Three kinds of memories - the new and delete operators – Allocators – custom allocators - …

Agenda (3/3)

- Templates: Function templates – class Templates – Instantiation – Specialization – Design and Implementation of simple generic algorithms - …
- Object-Oriented Programming: Base classes and Derived classes – Derivation – Inheritance - Access control: protected – Polymorphic code – Virtual functions – Abstract classes – Class hierarchies – Private and Protected inheritance – A quick overview on some typical design patterns: Abstract factory, builder, singleton, observer and visitors - …
- Concurrency and Parallelism: The free lunch is over! – Moore’s law – Amdahl’s Law – Threads: a definition - Single-threaded vs. Multi-threaded Hello, world! – Data races and Synchronization mechanisms – Locks and Mutexes – Thread safety - …
- Task-based parallelism: Futures and Promises – Packaged tasks - Async – Generic parallel algorithms - …

60 hours:

24 session each 2:30 hours