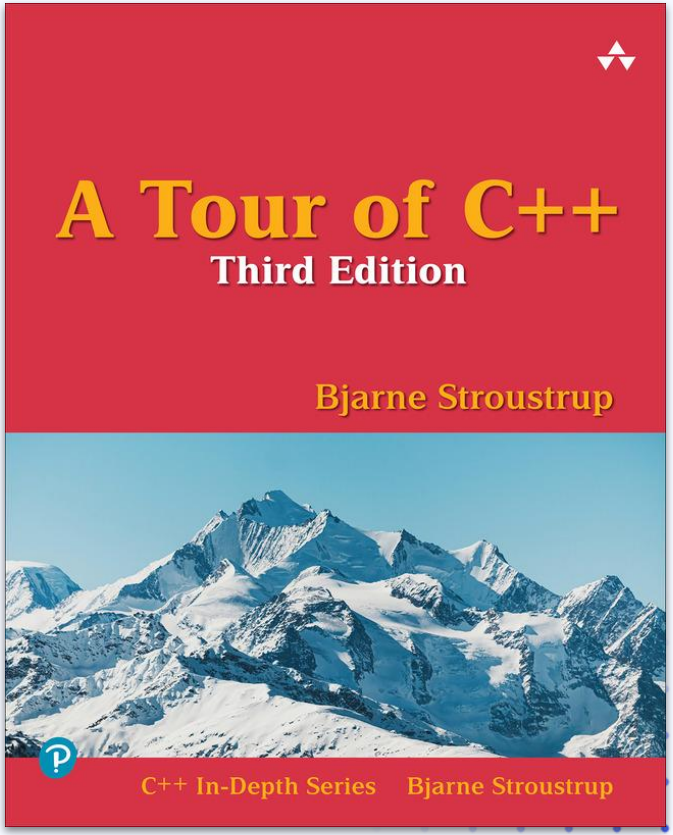
Essential Operations

CSE 232 - Dr. Josh Nahum

Reading:

Section 6.1 through Section 6.4



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00

Copy and Move

Copy Operations

Copy Constructor

Used to create a new object (clone) from an reference to an existing object. The existing object should (usually) be unchanged.

Copy Assignment

Changes the existing object (the left-hand-side of an assignment) to "match" the values of the right-hand-side object.

Move Operations

Move Constructor

Like the Copy Constructor, this function makes a new object from an existing object. However, the existing object will be destroyed.

Move Assignment

Like the Copy Assignment, but the right-hand-side will be destroyed.

Optional

The move operations are an optimization to prevent unnecessary copying. They won't be assessed in this course.

01

Rule of 3 (5/0)

“If a class requires a user-defined **destructor**, a user-defined **copy constructor**, or a user-defined **copy assignment operator**, it almost certainly requires all three.”

—Rule of three

“If a class user-defines any of the Rule of three member functions, and desires move semantics, it likely requires a user-defined **move constructor** and **move assignment operator**.”

—**Rule of five**

“If a class owns a resource, it should implement the rule of three/five functions, otherwise it should **not** have custom implementations of any of them.”

—**Rule of zero**

02

Operator Overloading

Common Cases

Equality

Often it is important to compare two objects for equality (==, !=)

Relational

Comparisons (>, >=, <, <=) are necessary if the objects need to be sorted or ranked

IO

Objects can read from a stream (operator>>) or print themselves to a stream (operator<<)

Don't Overdo It

Most classes only overload the previous operations at most. Only overload operators where there is a clear expectation from the user, otherwise, just make a regular named member function.

Attribution

Please ask questions via Piazza

Dr. Joshua Nahum
www.nahum.us
EB 3504

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