

C++ Programming

Move Constructors

Introduction

Before diving into move constructors, we need to have an understanding of some concepts.

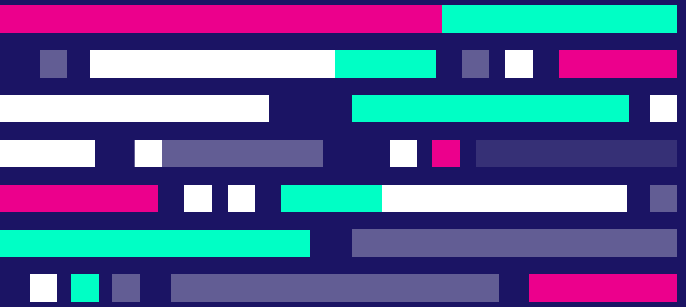
1. What are “l-value” and “r-value” references?
2. What is a copy constructor?
3. What is the problem we could face with copy constructors?



L-value VS R-value References



```
int var = 5;
// L-value reference
int& lref = var;
// If I need to reference a
// value directly
int& myref = 10;
// R-value reference
int&& rref = 6;
```



Copy Constructor

- A copy constructor is a member function that initializes an object using another object of the same class.

- Allows for deep-copy where an object's properties are copied one by one into a new object.

Problem with Copy Constructor and temporary objects?

Overhead

Un-necessary use of memory



Power

Decrease in code Computational Power



Problem

Un-necessary call to the copy constructor, overhead and in-efficient use of memory



Solution

Using the Move Constructor



Move Constructor

1. Points the new object to the data of the temporary object instead of copying

2. It then makes the pointer of the temporary object a null pointer

3. For a large number of temporary objects needing to be “moved” like when adding to a list, using the move constructor is an efficient choice.

4. A **move constructor** allows the resources owned by a rvalue object to be moved into a lvalue without creating its copy.

References

1. https://www.geeksforgeeks.org/lvalues-references-and-rvalues-references-in-c-with-examples/
2. https://www.geeksforgeeks.org/move-constructors-in-c-with-examples/
3. https://www.educative.io/edpresso/what-is-a-move-constructor-in-cpp
4. https://stackoverflow.com/questions/2860234/what-is-overhead/2860263
5. https://slidesgo.com/theme/programming-lesson

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