C++

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Topics to be discussed

- Object-Oriented Programming(Part-01)
  - Classes and objects
  - Creation of Class and Objects
  - Acessing Class members
  - Access Specifiers
  - Methods
  - Consructors and Destructors
  - Overloading Constructors
  - Delegating Constructors

Topics to be discussed

- Object-Oriented Programming(Part-02)
  - Copy Constructor
  - Shallow copy & Deep copy
  - Move constructor
  - this pointer
  - Static class members
  - Structure vs Classes
  - Friend of a Class

Object Oriented Programming

- Procedural programming(POP): writing the procedures
  - Process is splitting in to functions
  - Typically collection of functions
  - Easy to learn
  - Difficult to maintain
- Object oriented programming(OOP)
  - Designed around objects
  - Ability to simulate the real-word events
  - Provides data hiding and code reusability
  - Inheritance and Polymorphism

Classes and objects

- Classes:
  - Blueprint of objects
  - user-defined data-type
  - has attributes and methods // objects variable and function

- Objects:
  - Created from a class // specific instance of a class
  - Can create many objects with own identy
  - Variable of specified class

Creation of Class and Objects

- Class syntax:

```
class class_name{
    // attributes
    // methods
};
```

- Object declaration:

```
class_name object_name;
class_name *obj_ptr = new class_name();  // heap memory
```

Accessing class members

- can access
  - class attributes
  - class methods
  - Some members can’t be accessed from outside of class.

- can access using dot operator

Access specifiers

- Public
  - Accessible from everywhere
  - Members are public interface of the class
- Private : default
  - Accessible only by members or friends of the class
  - Can’t access from outside of the class
- Protected
  - Used with inheritance

Methods

- Implementation is very similar to functions
- Methods have access to member attributes
  - So you don’t need to pass them as arguments
- Can be implemented at inside and outside the class

Constructors & Destructors

- Constructors
  - Special member method
  - Invokes during object creation
  - Same name as class
  - Can be overloaded
- Destructors
  - Special member method
  - Invokes automatically during object destruction
  - Same name as class with tilde(~) at start
  - Only 1 destructor per class and it released memory & resources

Overloading constructors

- Similar to overloading functions
- Can have as many constructors
- Each constructor must have a unique signature
- Default constructor is no longer compiler-generated once constructor is overloaded
- Same constructor in different form
    - volume() volume(int len, int bre, int hei)
- Constructor Initialization lists

Delegating constructors

- C++ allows delegating constructors
- Delegating constructor will take care about default parameters
- Avoids duplication of code
- Code of one constructor can call another in the initialization list

Doubts

Q&A

End of the session

Thank You