Unit III

Implementing OOP Concepts (Nested Classes)

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Learning Outcomes

In this session, you will learn about:

- Nested Inner Class (Non-static inner class)
- Static class (Static Inner Class)

Nested Class?

- ***What is nested class?***
  - In Java, you can define a class within another class. Such class is known as nested class.
  - For example,

```
class OuterClass {
        // ...
        class NestedClass {
                // ...
        }
}
```

Type of Nested Class

- There are two types of nested classes you can create in Java.
  1. Non-static nested class (inner class)
  2. Static nested class

Note: Remember Access modifiers and static keyword

Non-Static Nested Class (Inner Class)

- A non-static nested class is a class within another class.
- It has access to members of the enclosing class (outer class).
- It is commonly known as inner class.
- Since the inner class exists within the outer class, you must instantiate the outer class first, in order to instantiate the inner class.

Example for Inner class

```
class CPU {
        double price;
        // nested class
        class Processor{
                double cores;
                String manufacturer;
                double getCache(){
                        return 4.3;
        } }
        // nested protected class
        protected class RAM{
                double memory;
                String manufacturer;
                double getClockSpeed(){
                        return 5.5;
        } }
}
```

```
public class Main { public static void main(String[] args) {
        CPU cpu = new CPU();
        CPU.Processor processor = cpu.new Processor();
        CPU.RAM ram = cpu.new RAM();
        System.out.println("Processor Cache = " +
                        processor.getCache());
        System.out.println("Ram Clock speed = " +
                        ram.getClockSpeed());
} }
```

Output:
Processor Cache = 4.3
Ram Clock speed = 5.5

Accessing Members of Outer Class within Inner Class

- We can access the members of the outer class directly.

- We can access the members of the outer class by using this keyword if data members have same name.

Static Nested Class

- In Java, we can also define a static class inside another class. Such class is known as static nested class.
- Static nested classes are not called static inner classes.
- Unlike inner class, a static nested class cannot access the member variables of the outer class.
- It is because the **static nested class** doesn't require you to create an instance of the outer class.

Example: Static Nested Class

```
class MotherBoard {
        // static nested class
        static class USB{
                int usb2 = 2;
                int usb3 = 1;
                int getTotalPorts(){
                        return usb2 + usb3;
        } }
}
public class Main {
        public static void main(String[] args) {
                // create an object of the static nested class
                // using the name of the outer class
                MotherBoard.USB usb = new MotherBoard.USB();
                System.out.println("Total Ports = " + usb.getTotalPorts());
} }
```

Thank you!