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Lab Assignment – 10

Q1: Write a Java program that demonstrates method overriding by creating a superclass called Animal and two subclasses called Dog and Cat.

- The Animal class should have a method called makeSound(), which simply prints "The animal makes a sound."
- The Dog and Cat classes should override this method to print "TheCat/The dog meows/barks" respectively.
- The program should allow the user to create and display objects of each class.

Input:

```
package corejava;
public class Animal {
    public void makeSound() {
        System.out.println("The animal makes a sound.");
    }
}

class Dog extends Animal {
    @Override
    public void makeSound() {
        System.out.println("The dog barks.");
    }
}

class Cat extends Animal {
    @Override
    public void makeSound() {
        System.out.println("The cat meows.");
    }
}
```

```
public static void main(String[] args) {  
    //If you want to print "The animal makes a sound.",  
    //you can create an Animal object and call the makeSound() method on it.  
        Animal animal = new Animal();  
        animal.makeSound();  
  
        Animal dog = new Dog();  
        Animal cat = new Cat();  
        dog.makeSound();  
        cat.makeSound();  
  
    }  
}
```

Output:

The animal makes a sound.
The dog barks.
The cat meows.

Q2: Create a Java abstract class named **Book**.

1. Add private attributes to the **Book** class: **title**, **author**, and **publicationYear**.
2. Provide a constructor to initialize the attributes.
3. Add an abstract method, **displayInfo()**, to the **Book** class.
4. Create two subclasses: "Novel" and "Textbook." by extending Book class.
5. Override the **displayInfo()** method in each subclass to display specific information:
 - In the "Novel" subclass, display the genre of the novel.
 - In the "Textbook" subclass, display the subject of the textbook.

Input:

```
package corejava;
abstract class Book
{
    private String title;
    private String author;
    private int publicationYear;

    Book(String t,String a,int y)
    {
        title = t;
        author = a;
        publicationYear = y;
        System.out.println(title+"
Title\n"+author+"Author\n"+publicationYear+"Publication Year");
    }
    abstract void displayInfo();
}

class Noval extends Book
{
    Noval(String t,String a,int y)
    {
        super(t,a,y);
    }
    void displayInfo()
```

```
    {  
        System.out.println("This is a Noval");  
    }  
}
```

```
class TextBook extends Book  
{  
    TextBook(String t,String a,int y)  
    {  
        super(t,a,y);  
    }  
    void displayInfo()  
    {  
        System.out.println("This is a Textbook");  
    }  
}
```

```
public class Abstraction  
{  
    public static void main(String[] args)  
    {  
        Noval n = new Noval("Afterlives","Abdulrazak Gurnah",2022);  
        n.displayInfo();  
        System.out.println("*****");  
        TextBook t = new TextBook("Head First Java","Kathy Sierra",2003);  
        t.displayInfo();  
        System.out.println("*****");  
    }  
}
```

Output:

Afterlives Title

Abdulrazak Gurnah Author

2022 Publication Year

This is a Noval

Head First Java Title

Kathy Sierra Author

2003 Publication Year

This is a Textbook
