**Exercise 1: Implementing the Singleton Pattern**

1. **Class Hello(Main class) :**

package collect;

public class Hello {

public static void main(String[] args) {

Singleton s1 = Singleton.getInst();

s1.dispMessage();

Singleton s2 = Singleton.getInst();

s2.dispMessage();

if (s1 == s2) {

System.out.println("Singleton works");

} else {

System.out.println("Singleton failed as the instances are not the same");

}

}

}

1. **Class Singleton :**

package collect;

public class Singleton {

private static Singleton instance;

private Singleton() {

System.out.println("Singleton instance created");

}

public static Singleton getInst() {

if (instance == null) {

instance = new Singleton();

}

return instance;

}

public void dispMessage() {

System.out.println("Hello!");

}

}

A screenshot of a computer

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**Exercise 2: Implementing the Factory Method Pattern**

* **package** shape; //*Shape Interface*

**public** **interface** Shape {

**void** design();

}

* **package** shape;// *class Rectangle*

**public** **class** Rectangle **implements** Shape {

@Override

**public** **void** design() {

System.***out***.println("Draw a Rectangle");

}

}

* **package** shape; // *class Circle*

**public** **class** Circle **implements** Shape {

@Override

**public** **void** design() {

System.***out***.println("Draw a Circle");

}

}

* **package** shape;// *class Factory*

**public** **class** Factory {

**public** Shape getShape(String shapeType) {

**if** (shapeType == **null** || shapeType.isEmpty()) **return** **null**;

**switch** (shapeType.toUpperCase()) {

**case** "CIRCLE":

**return** **new** Circle();

**case** "RECTANGLE":

**return** **new** Rectangle();

**default**:

**return** **null**;

}

}

}

* **public** **class** Main {

**public** **static** **void** main(String[] args) {

Factory factory = **new** Factory();

Shape shape1 = factory.getShape("CIRCLE");

shape1.design();

Shape shape2 = factory.getShape("RECTANGLE");

shape2.design();

}

}

A screenshot of a computer

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