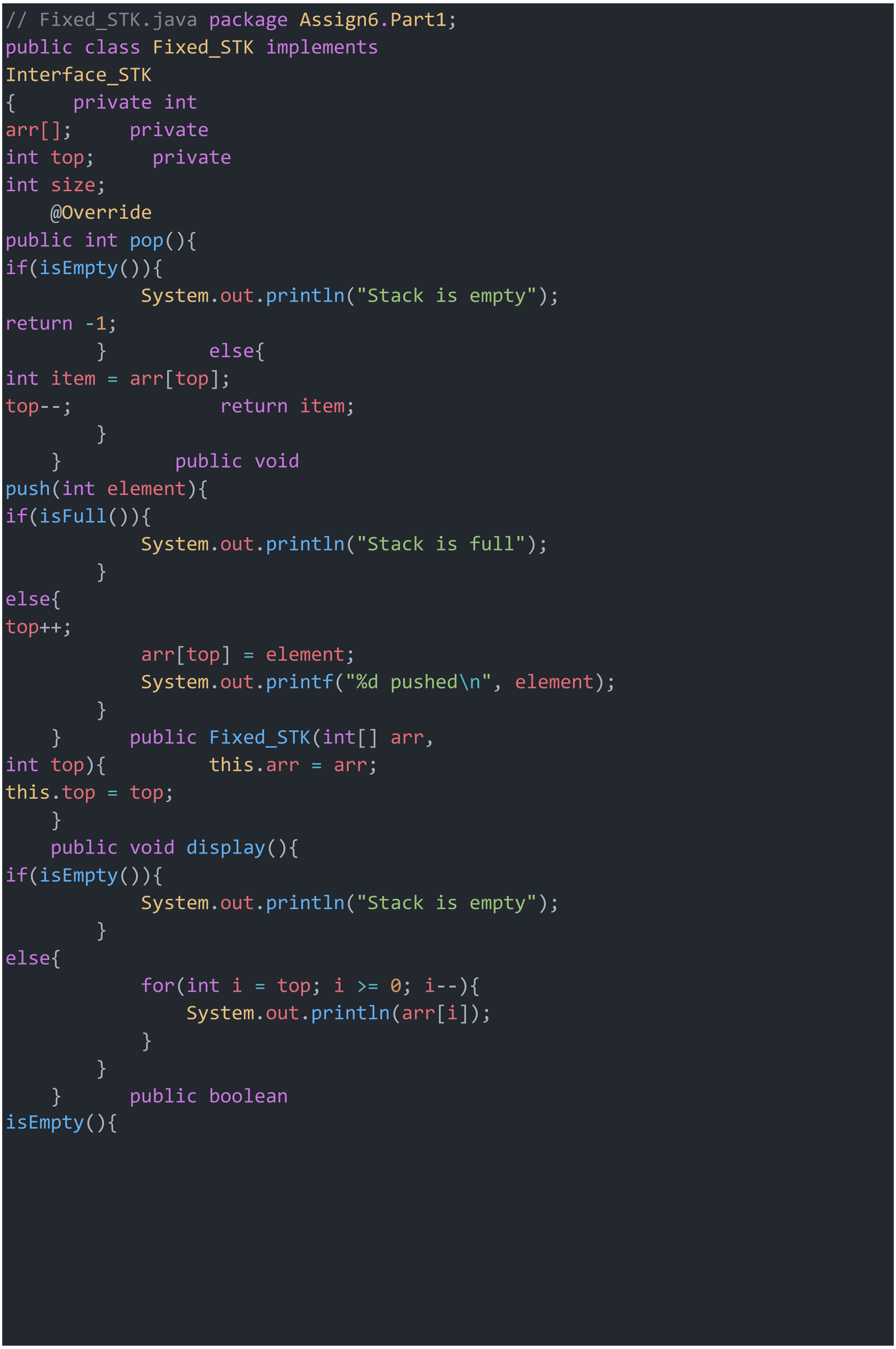
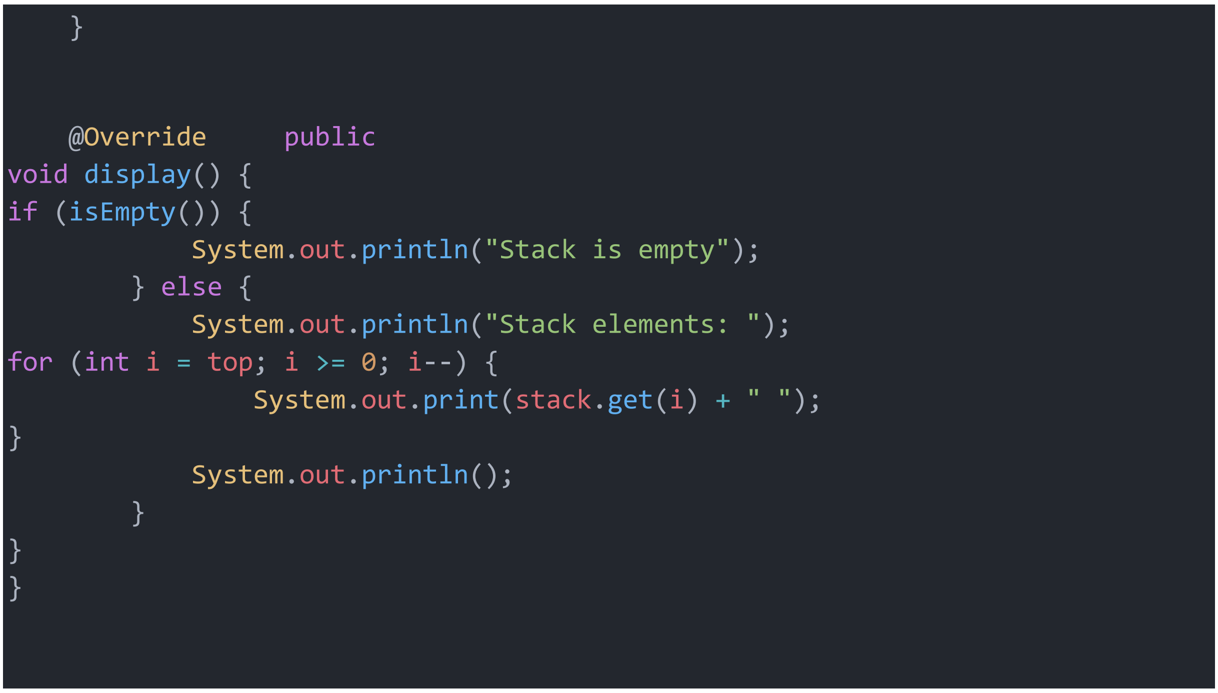
Suyash Tambe Assignment 6

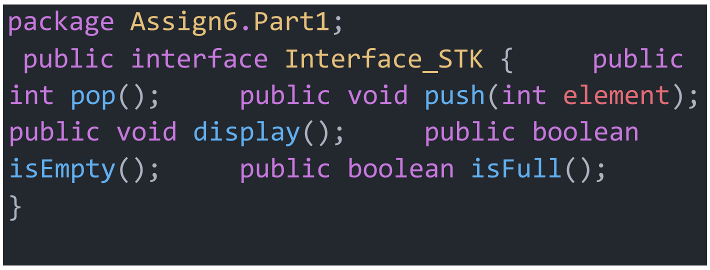


```
// Fixed_STK.java package Assign6.Part1;
public class Fixed_STK implements
Interface_STK
{     private int
arr[];     private
int top;     private
int size;
    @Override
public int pop(){
if(isEmpty()){
            System.out.println("Stack is empty");
return -1;
        }         else{
int item = arr[top];
top--;             return item;
        }
    }          public void
push(int element){
if(isFull()){
            System.out.println("Stack is full");
        }
else{
top++;
            arr[top] = element;
            System.out.printf("%d pushed\n", element);
        }
    }      public Fixed_STK(int[] arr,
int top){         this.arr = arr;
this.top = top;
    }
    public void display(){
if(isEmpty()){
            System.out.println("Stack is empty");
        }
else{
            for(int i = top; i >= 0; i--){
                System.out.println(arr[i]);
            }
        }
    }      public boolean
isEmpty(){
        return top == -1;
    }      public boolean isFull(){         return top
== size - 1;
    }
}
```

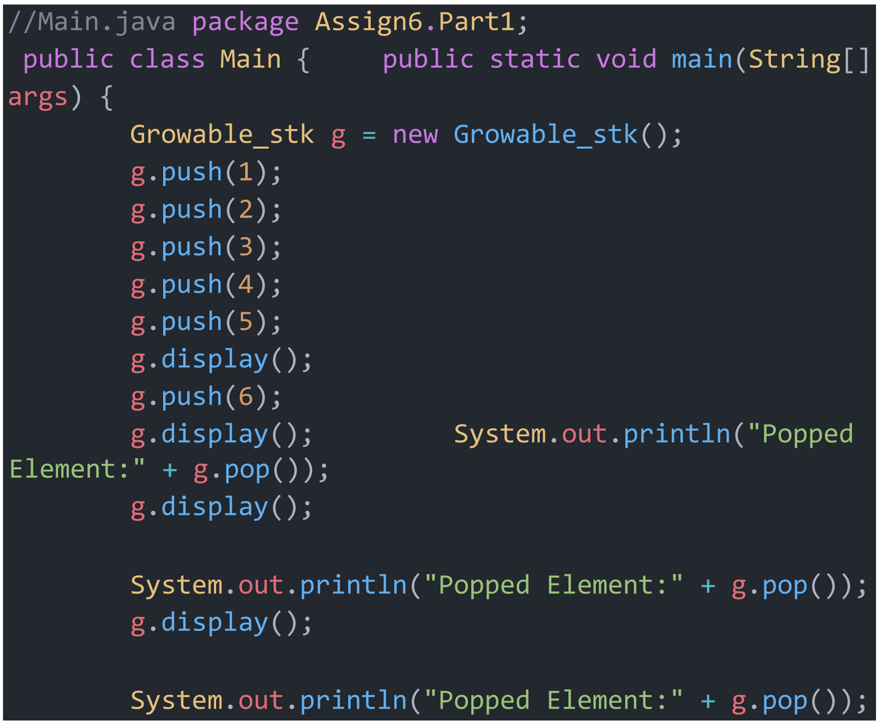
```
//Growable_stk.java
package Assign6.Part1;
 import
java.util.ArrayList;

public class Growable_stk implements
Interface_STK{     ArrayList<Integer> stack;
int top;
     public Growable_stk(){
top = -1;          stack = new
ArrayList<>(5);
    }

    @Override     public
boolean isEmpty(){
return top == -1;
    }

    @Override
public int pop(){
if(top == -1){
            System.out.println("Stack is empty");
return -1;
        }          else{
return stack.remove(top--);
        }
    }

    @Override     public void
push(int element){
stack.add(++top, element);
    }

    @Override
    public boolean isFull(){
        System.out.println("Stack is not growable");
return false;
```



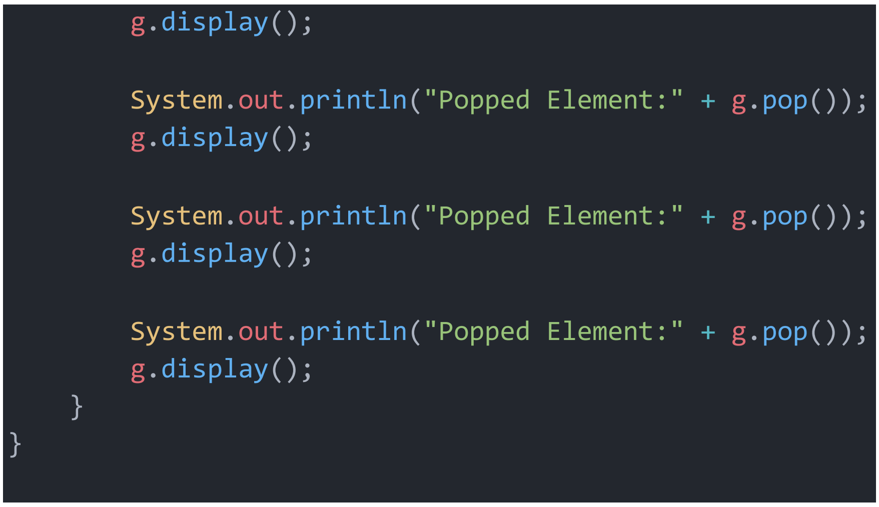
```
    }


    @Override     public
void display() {
if (isEmpty()) {
            System.out.println("Stack is empty");
        } else {
            System.out.println("Stack elements: ");
for (int i = top; i >= 0; i--) {
                System.out.print(stack.get(i) + " ");
}
            System.out.println();
        }
}
}
```



```
package Assign6.Part1;
 public interface Interface_STK {     public
int pop();     public void push(int element);
public void display();     public boolean
isEmpty();     public boolean isFull();
}
```

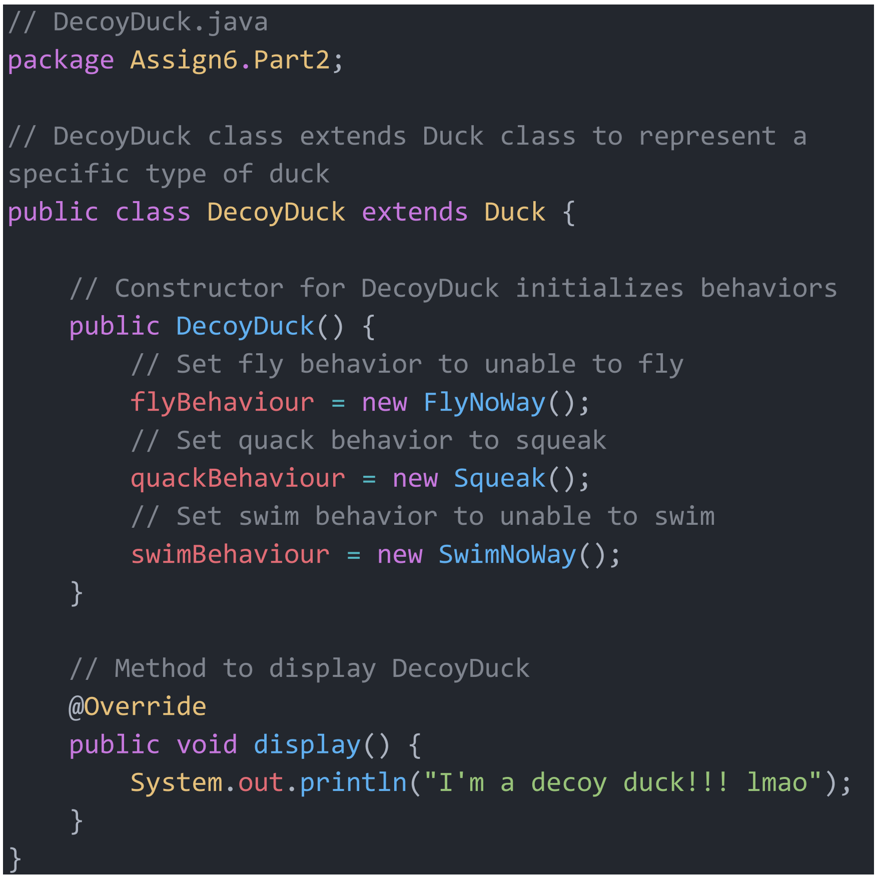


```
//Main.java package Assign6.Part1;
 public class Main {     public static void main(String[]
args) {
        Growable_stk g = new Growable_stk();
        g.push(1);
        g.push(2);
        g.push(3);
        g.push(4);
        g.push(5);
        g.display();
        g.push(6);
        g.display();         System.out.println("Popped
Element:" + g.pop());
        g.display();

        System.out.println("Popped Element:" + g.pop());
        g.display();

        System.out.println("Popped Element:" + g.pop());
```

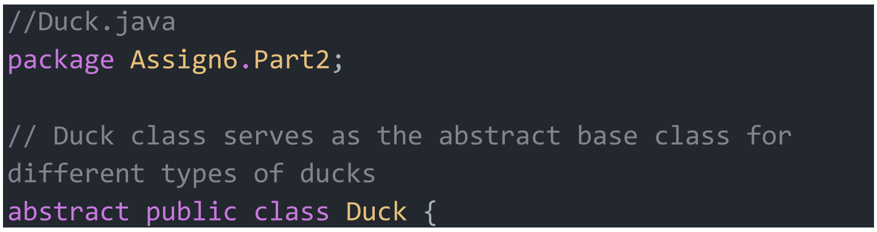


```
        g.display();

        System.out.println("Popped Element:" + g.pop());
        g.display();

        System.out.println("Popped Element:" + g.pop());
        g.display();

        System.out.println("Popped Element:" + g.pop());
        g.display();
    }
}
```

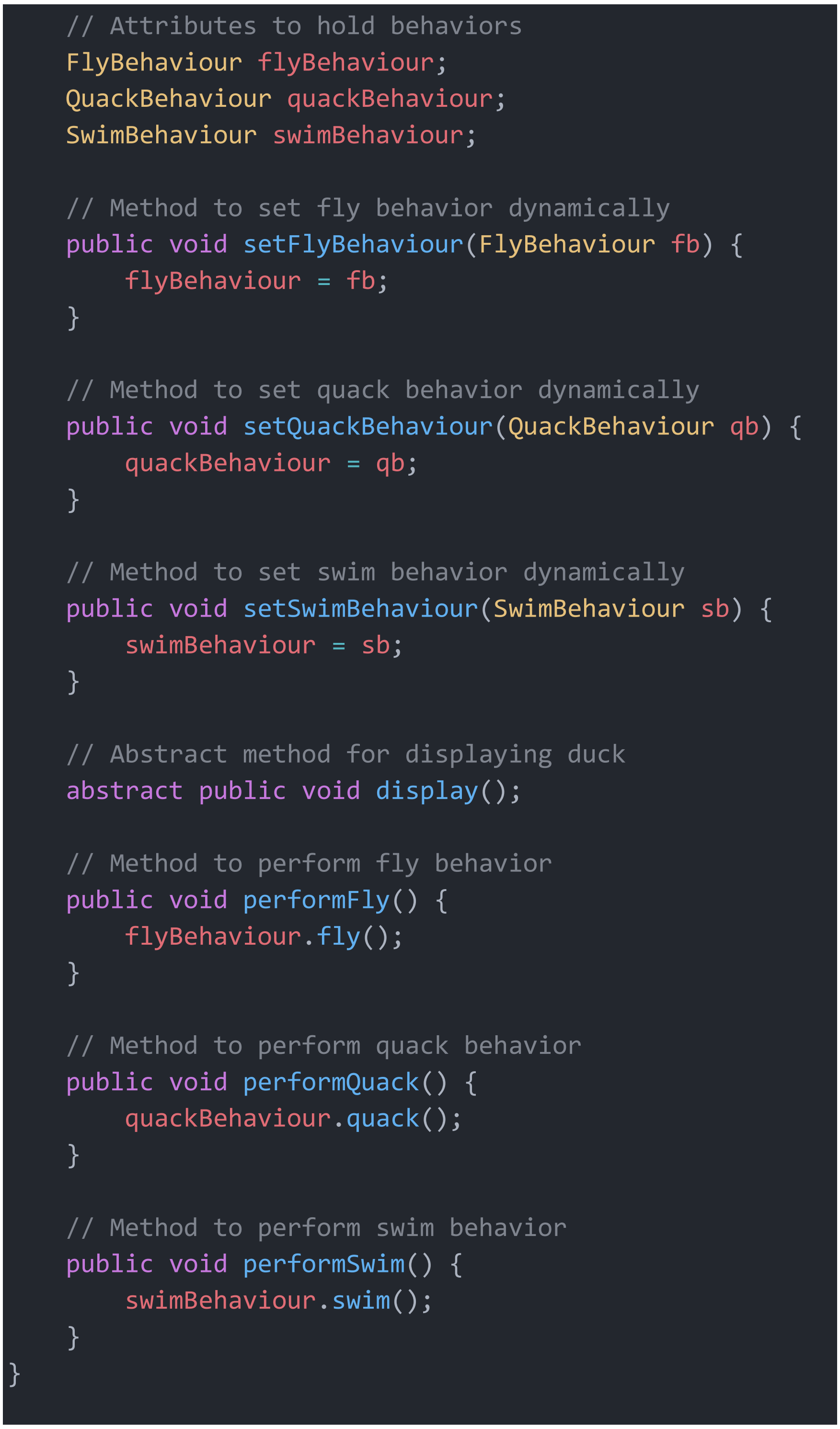
Part 2



```
// DecoyDuck.java
package Assign6.Part2;

// DecoyDuck class extends Duck class to represent a
specific type of duck
public class DecoyDuck extends Duck {

    // Constructor for DecoyDuck initializes behaviors
    public DecoyDuck() {
        // Set fly behavior to unable to fly
        flyBehaviour = new FlyNoWay();
        // Set quack behavior to squeak
        quackBehaviour = new Squeak();
        // Set swim behavior to unable to swim
        swimBehaviour = new SwimNoWay();
    }

    // Method to display DecoyDuck
    @Override
    public void display() {
        System.out.println("I'm a decoy duck!!! lmao");
    }
}
```



```
//Duck.java
package Assign6.Part2;

// Duck class serves as the abstract base class for
different types of ducks
abstract public class Duck {
```



```
    // Attributes to hold behaviors
    FlyBehaviour flyBehaviour;
    QuackBehaviour quackBehaviour;
    SwimBehaviour swimBehaviour;

    // Method to set fly behavior dynamically
    public void setFlyBehaviour(FlyBehaviour fb) {
        flyBehaviour = fb;
    }

    // Method to set quack behavior dynamically
    public void setQuackBehaviour(QuackBehaviour qb) {
        quackBehaviour = qb;
    }

    // Method to set swim behavior dynamically
    public void setSwimBehaviour(SwimBehaviour sb) {
        swimBehaviour = sb;
    }

    // Abstract method for displaying duck
    abstract public void display();

    // Method to perform fly behavior
    public void performFly() {
        flyBehaviour.fly();
    }

    // Method to perform quack behavior
    public void performQuack() {
        quackBehaviour.quack();
    }

    // Method to perform swim behavior
    public void performSwim() {
        swimBehaviour.swim();
    }
}
```

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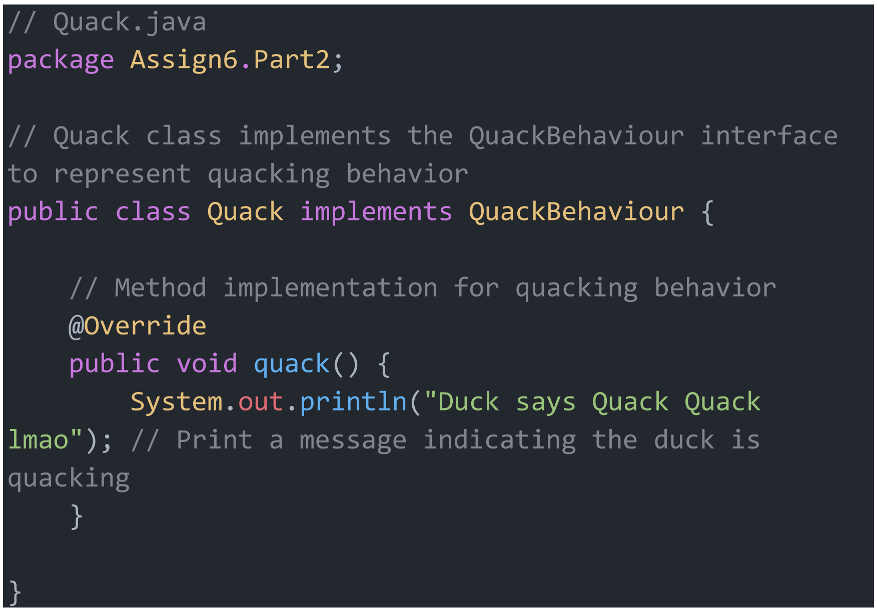
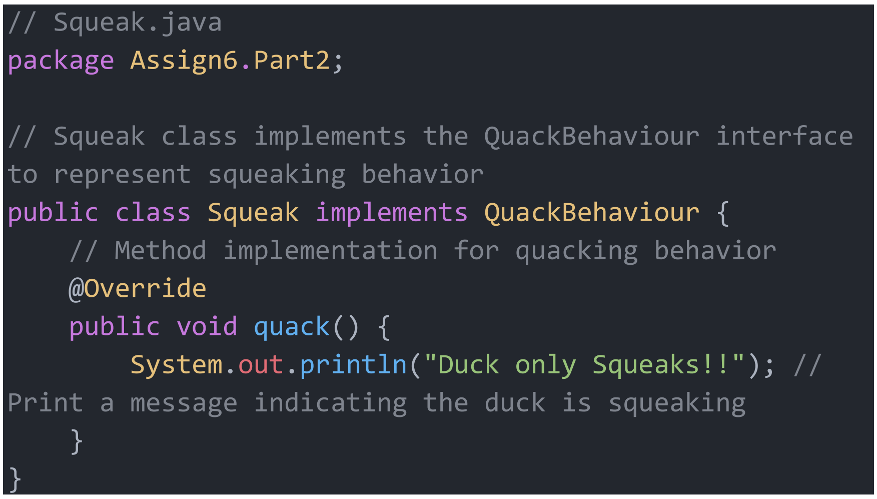
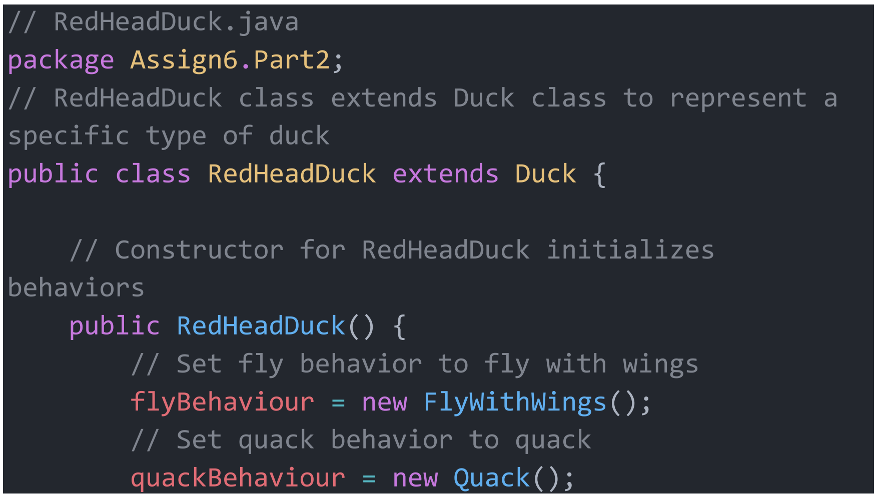


```
// Quack.java
package Assign6.Part2;

// Quack class implements the QuackBehaviour interface
to represent quacking behavior
public class Quack implements QuackBehaviour {

    // Method implementation for quacking behavior
    @Override
    public void quack() {
        System.out.println("Duck says Quack Quack
lmao"); // Print a message indicating the duck is
quacking
    }

}
```



```
// Squeak.java
package Assign6.Part2;

// Squeak class implements the QuackBehaviour interface
to represent squeaking behavior
public class Squeak implements QuackBehaviour {
    // Method implementation for quacking behavior
    @Override
    public void quack() {
        System.out.println("Duck only Squeaks!!"); //
Print a message indicating the duck is squeaking
    }
}
```



```
// RedHeadDuck.java
package Assign6.Part2;
// RedHeadDuck class extends Duck class to represent a
specific type of duck
public class RedHeadDuck extends Duck {

    // Constructor for RedHeadDuck initializes
behaviors
    public RedHeadDuck() {
        // Set fly behavior to fly with wings
        flyBehaviour = new FlyWithWings();
        // Set quack behavior to quack
        quackBehaviour = new Quack();
        // Set swim behavior to swim
        swimBehaviour = new Swim();
    }

    // Method to display RedHeadDuck
    @Override
    public void display() {
        System.out.println("I'm a red head duck!!!
Lmao"); // Print a message indicating the duck is a red
head duck
    }
}
```

```
// Main.java
package Assign6.Part2;

// Main class to test duck behaviors
public class Main {
    public static void main(String[] args) {
        // Create a RedHeadDuck object
        RedHeadDuck redHeadDuck = new RedHeadDuck();

        // Display information about RedHeadDuck
        redHeadDuck.display();

        // Perform swim, fly, and quack behaviors of
RedHeadDuck
        redHeadDuck.performSwim();
        redHeadDuck.performFly();
        redHeadDuck.performQuack();

        // Create a DecoyDuck object
        DecoyDuck decoyDuck = new DecoyDuck();

        // Display information about DecoyDuck
        decoyDuck.display();

        // Perform fly, quack, and swim behaviors of
DecoyDuck
        decoyDuck.performFly();
        decoyDuck.performQuack();
        decoyDuck.performSwim();
    }
}
```

Output:

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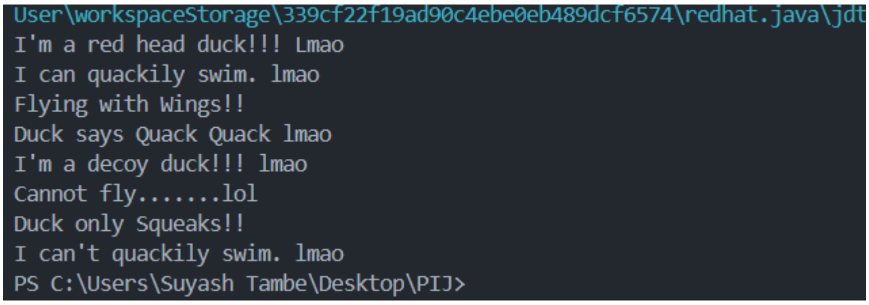

```
User\workspaceStorage\339cf22f19ad90c4ebe0eb489dcf6574\redhat.java\jdt
I'm a red head duck!!! Lmao
I can quackily swim. lmao
Flying with Wings!!
Duck says Quack Quack lmao
I'm a decoy duck!!! lmao
Cannot fly.......lol
Duck only Squeaks!!
I can't quackily swim. lmao
PS C:\Users\Suyash Tambe\Desktop\PIJ>
```