Assignment 3

<u>Exercise 1:</u>

➜ It violates the single responsibility principle. As the Feline class represents a family of cat species, the Tiger class inherits the Feline class with additional instance variable breed.

➜ Here, in the Tiger class, except the camouflage, it has a single responsibility to perform basic functions.

➜ Hence, the Tiger class is violating the Single Responsibility Principle, which states that the class should have only one single responsibility.

<u>Exercise 2:</u>

➜ It is in violation of the Interface Segregation principle. According to the specifications, developer must implement the WorkerInterface, which does not need the eat() function for the robot class.

➜ As a result, the developer must edit the WorkerInterface, which has a single task to work. In addition, we must design another interface, LivingBeingInterface, which provides the eat method.

➜ Finally, the Worker and the SuperWorker must implement both the WorkerInterface and the LivingBeingInterface. However, RobotWorker only implement the WorkerInterface that satisfies the Interface segregation principle.

```
interface WorkerInterface {
    public void work();
}

interface LivingBeingInterface {
    public void eat();
}

class Worker implements WorkerInterface, LivingBeingInterface {
    public void work() {/* Work */}
    public void eat() {/* Eat */}
}

class SuperWorker implements WorkerInterface, LivingBeingInterface {
    public void work() {/* More work */}
    public void eat() {/* Eat */}
}

class RobotWorker implements WorkerInterface {
  public void work() {/* Tireless Work */}
}
```
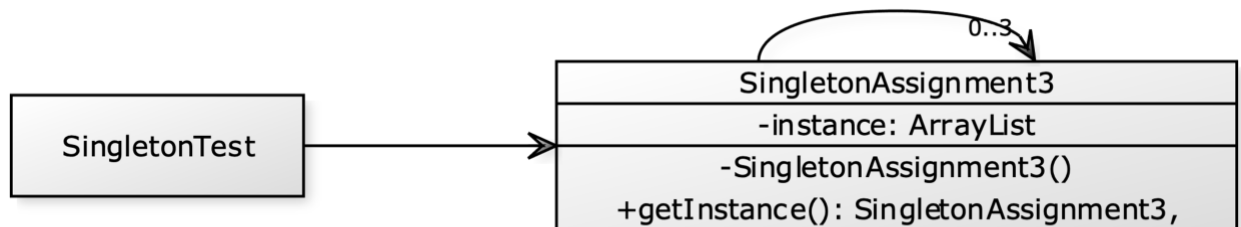
Exercise 3:

Source files
➔ SingletonAssignment3: src/Q3/SingletonAssignment3.java
➔ SingletonTest: src/Q3/SingletonTest.java

```
                                          0..3
┌──────────────┐        ┌──────────────────────────────────────┐
│              │        │        SingletonAssignment3           │
│ SingletonTest│───────▶├──────────────────────────────────────┤
│              │        │        -instance: ArrayList           │
└──────────────┘        ├──────────────────────────────────────┤
                        │        -SingletonAssignment3()        │
                        │ +getInstance(): SingletonAssignment3, │
                        └──────────────────────────────────────┘
```

Exercise 4:

Source files
➔ IOSFactory: src/Q4/IOSFactory.java
➔ IOSListBox: src/Q4/IOSListBox.java
➔ IOSPushButton: src/Q4/IOSPushButton.java
➔ IOSTextField: src/Q4/IOSTextField.java
➔ LinuxFactory: src/Q4/LinuxFactory.java
➔ LinuxListBox: src/Q4/LinuxListBox.java
➔ LinuxPushButton: src/Q4/LinuxPushButton.java
➔ LinuxTextField: src/Q4/LinuxTextField.java
➔ ListBox: src/Q4/ListBox.java
➔ PushButton: src/Q4/PushButton.java
➔ TextField: src/Q4/TextField.java
➔ WidgetAbstractFactory: src/Q4/ WidgetAbstractFactory.java
➔ WidgetDriver: src/Q4/WidgetDriver.java
➔ WindowsFactory: src/Q4/WindowsFactory
➔ WindowsListBox: src/Q4/WindowsListBox
➔ WindowsPushButton: src/Q4/WindowsPushButton
➔ WindowsTextField: src/Q4/WindowsTextField

```
                                    <<abstract>>
                                 WidgetAbstractFactory
                              +createTextField(): TextField
                              +createPushButton(): PushButton
                              +createListBox(): ListBox
```

```
   WindowsFactory              <<interface>>          IOSFactory            <<interface>>        <<interface>>            LinuxFactory
+createTextField(): TextField    TextField       +createTextField(): TextField   PushButton          ListBox       +createTextField(): TextField
+createPushButton(): PushButton  +renderTextField(): String  +createPushButton(): PushButton  +renderPushButton(): String  +renderListBox(): String  +createPushButton(): PushButton
+createListBox(): ListBox                        +createListBox(): ListBox                                              +createListBox(): ListBox
```

```
 WindowsTextField    WindowsPushButton      IOSTextField     WindowsListBox      IOSPushButton       IOSListBox       LinuxTextField    LinuxPushButton      LinuxListBox
+renderTextField(): String  +renderPushButton(): String  +renderTextField(): String  +renderListBox(): String  +renderPushButton(): String  +renderListBox(): String  +renderTextField(): String  +renderPushButton(): String  +renderListBox(): String
```