AKADEMIA FINANSÓW I BIZNESU VISTULA

WSTĘP DO PROGRAMOWANIA DLA TESTERÓW

„Everything I was I carry with me, everything I will be, lies waiting on the road ahead”

by Ma Jian

Wstęp do programowania Java dla testerów

Remigiusz Dudek

AGENDA

„THE FIRST STEP TOWARDS GETTING SOMEWHERE IS TO DECIDE THAT YOU ARE NOT GOING TO STAY WHERE YOU ARE" BY ANNONYMOUS

- Basics + Java basics
  - IDE – project structure
  - Class/Object/Package
  - First @Test
  - Basics (variables / methods)
  - Primitive types
  - Assetions
  - Basic Classes
  - Basic inheritance / Object creation
  - Equality
  - Strings
  - Arrays/Collection
  - Steer the flow (conditions/loops)
- OO Design
  - Data driven testing (Parameters & File IO)
  - Design pattern - Singleton
  - Exceptions
  - Inheritance
  - Page Object Pattern
  - *Polymorphism*

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DATA DRIVEN TESTING

„A journey of a thousand miles, begins with a single step”

by Lau-Tzu

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JUNIT PARAMS

```
<repositories>
    <repository>
        <id>CentralMavenRepository</id>
        <url>http://central.maven.org/maven2/</url>
    </repository>
</repositories>
```

1. How to run the same test with different input parameters?

```
<dependencies>
    (. . .)
    <dependency>
        <groupId>pl.pragmatists</groupId>
        <artifactId>JUnitParams</artifactId>
        <version>1.0.5</version>
        <scope>test</scope>
   </dependency>
</dependencies>
```

JUNIT PARAMS

```
@RunWith(JUnitParamsRunner.class)
public class ParameterizedTests {
    @Test
    @Parameters({
            "1, 2, 3",
            "3, 1, 2",
            "2, 3, 1"})
    public void shouldNotBePossibleToCreateTriangle(int a, int b, int c) {
        TriangleValidator triangleValidator = new TriangleValidator();

        boolean isValid = triangleValidator.validate(a, b, c);

        Assertions.assertThat(isValid).isFalse();
    }

    @Test
    @FileParameters("src/test/resources/org/vistula/dudekre/credentials.csv")
    public void readParametersFromFile(String username, String password) {
        System.out.println(username + "," + password);
    }
}
```

EXCERCISE

1. Redo any of tests already created with usage of JUnitParams (ex. PalindromeChecker)

DESIGN PATTERN – SINGLETON

```
public class Singleton {
    private static Singleton instance;

    private Singleton() {}

    public static Singleton getInstance() {
        if (instance == null) {
            instance = new Singleton();
        }
        return instance;
    }
}
```

EXCERCISE

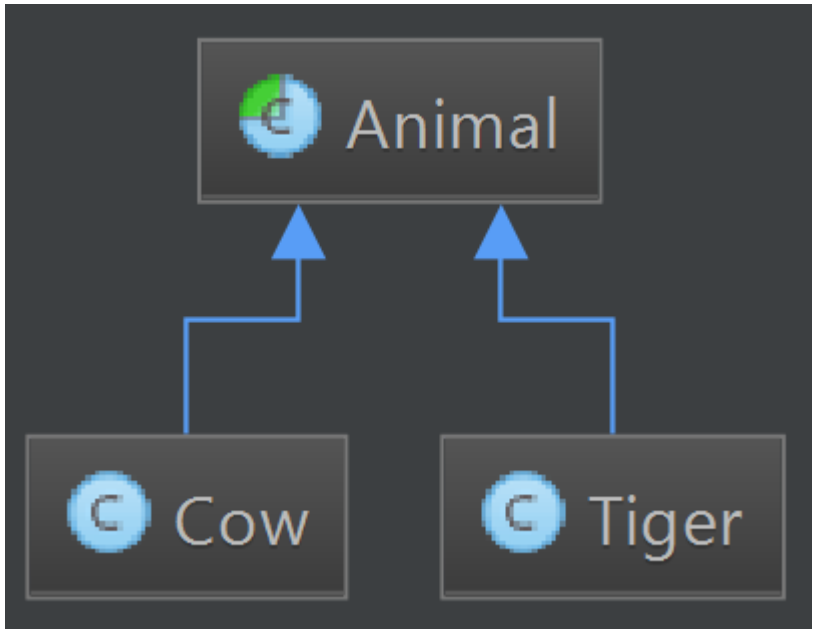
1. Make `CredentialsValidator` to be a `Singleton`

```
public class CredentialsValidator {
    boolean validate(String username, String password) {
        . . .
    }

    public void addValidCredentials(String username, String passwod) {
        . . .
    }
}
```

INHERITANCE/IMPLEMENTATION

1. Inheritance
   a) „Is something" relation
      a) Cow is an Animal
      b) Tiger is an Animal
   b) **Extends** the base class
   c) Inherit (have access to) all public method
   d) **protected** fields/method visible for children
   e) **abstract** class cannot be instatiated (all abstract methods needs to be implemented)

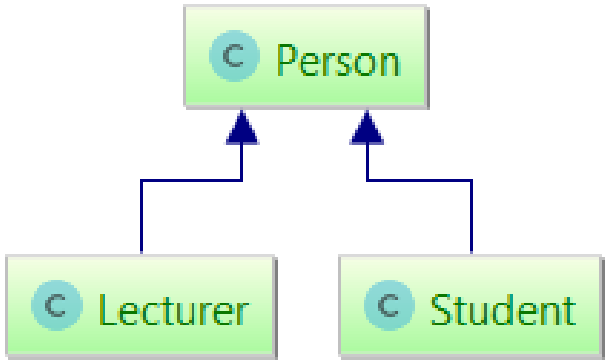
2. Implementation
   a) „Behaves like something" relations
      a) Lamp is `Switchable`
      b) Washing machine is `Switchable`
   b) Interface is a set of methods that needs to be implemented
   c) All methods defined in an interface are public



INHERITANCE

```java
public class Person {
    private String name;

    public Person(String name) {
        this.name = name;
    }

    public void marry(Person p) {
        this.name = p.name;
    }

    public String name() {
        return name;
    }
}
```

```java
public class Lecturer extends Person {
    private Date hiringDate;

    public Lecturer(String name, Date hiringDate) {
        super(name);
    }

    public NoticePeriod  noticePeriod() {
        return THREE_MONTHS;
    }
}
```



EXCERCISE

1. Create `AdministratorPage, HomePage, LoginPage` (all are `WebPages`)

```
public class Person {
    private String name;

    public Person(String name) {
        this.name = name;
    }

    public void marry(Person p) {
        this.name = p.name;
    }

    public String name() {
        return name;
    }
}
```

```
public class Lecturer extends Person {
    private Date hiringDate;

    public Lecturer(String name, Date hiringDate) {
        super(name);
    }

    public NoticePeriod  noticePeriod() {
        return THREE_MONTHS;
    }
}
```

EXCEPTIONS

1. Used to handle exceptional situations
2. `Throw` keyword
3. All Exceptions should extend Exception class
   1. Message
   2. Caused by
   3. Stack trace
4. `Try/Catch`
   1. `RuntimeException`
   2. `Exception`

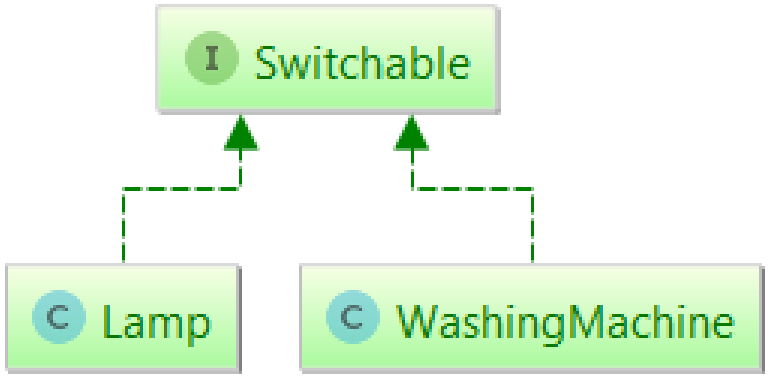
```
public class InvalidLoginException extends RuntimeException {
    public InvalidLoginException(String message) {
        super(message);
    }

    public InvalidLoginException(Throwable cause) {
        super(cause);
    }
}
```

EXCERCIZE

1. If TriangleValidator gets invalid input (e.g. negative number) it should throw exception
2. Credentials validator should throw exception if credentials are invalid

INTERFACES

1. Implementation
   a) „Behaves like something" relations
      a) Lamp is `Switchable`
      b) Washing machine is `Switchable`
   b) Interface is a set of methods that needs to be implemented
   c) All methods defined in an interface are public




```java
public interface Switchable {
    void turnOn();
    void turnOff();
}
```

```java
public class Lamp implements Switchable {
    public void turnOn() {
        System.out.println("Here is the light");
    }

    public void turnOff() {
        System.out.println("Lamp is turned off");
    }
}
```

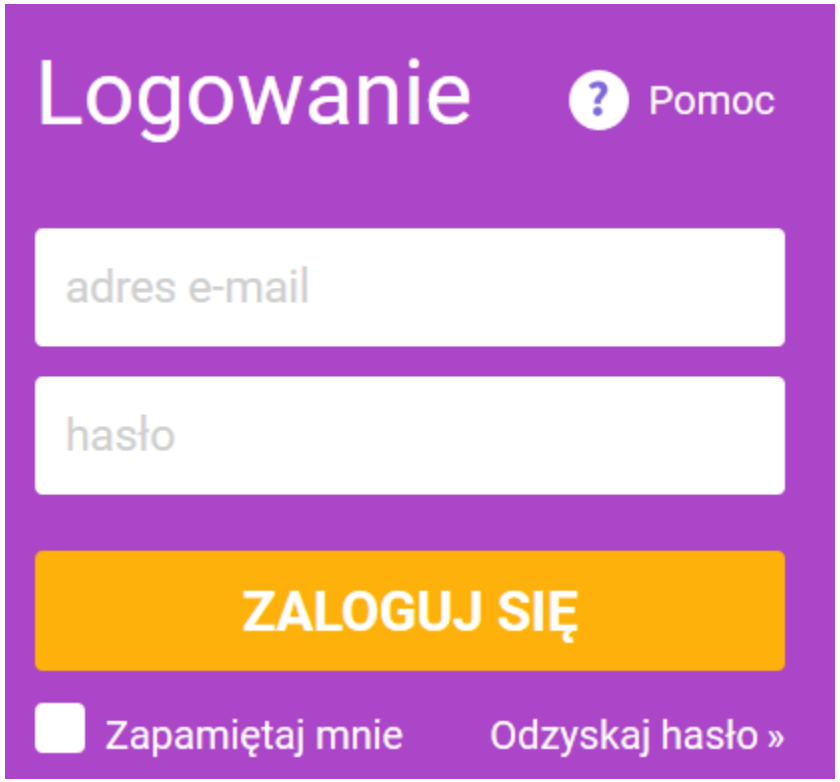
```java
public class WashingMachine implements Switchable {
    public void turnOn() {
        System.out.println("Started washing");
    }

    public void turnOff() {
        System.out.println("Washing machine is turned off");
    }
}
```

EXCERCISE

1. `CredentialsValidator` **behaves like** `CredentialsStore` **and** *`CredentialsValidator`* **(sic!)**

PAGE OBJECT PATTERN

```
public class EmailLoginPage extends WebPage {
    public EmailHomePage validLogin(String email, String password) {
        typeInEmailAndPassword(email, password);
        pressLogInButton();
        return new EmailHomePage();
    }

    public InvalidLoginPage invalidLogin() {
        typeInEmailAndPassword("invalid@invalid.com", "invalid");
        pressLogInButton();
        return new InvalidLoginPage();
    }

    public PasswordRetrievalPage retrievePassword() {
        return new PasswordRetrievalPage();
    }

    public void checkRememberMe() {
        checkRememberMeTickBox();
    }
}
```



HOMEWORK

1. Basing on Page Object Pattern create framework for testing web pages
   a) Characteristics of an aplication (blog)
      i. We always start from LoginPage (Administrator account is by default available)
      ii. After logging as administrator, AdministrationPanel is opened and user is able to add another user (username + password)
      iii. Only added users can log to an application (if invalid credentials are provided, Invalid Login Page is displayed)
      iv. Once user is properly logged in, HomePage for given user is displayed
      v. Being on a home page user can add new Article (Article = Title + text)
      vi. Being on a home page user can remove existing Articles
      vii. Being on a home page user can read all articles that has been added
   b) Test scenarios
      i. After logging with Invalid credentials InvalidLoginPage is displayed
      ii. Only added users can log in
      iii. It should be possible to add Article
      iv. It should be possible to remove Article

EXTRA HOMEWORK

1. Write scoring engine for simplified Dices – given three dices (1-6) following scoring rules should be applied
   a) If all three dices indicate different number – 0 pts
   b) If two numbers are the same – 10 pts
   c) If three numbers are the same – 20 pts
2. Write a Converter class that can convert string `The value is:` … into appropriate type (Converter will have three different methods)
   1. `The value is: 102` – method should return `int 102`
   2. `The value is: true` – method should return `boolean true`
   3. `The value is: The value is:` – method should return `String The value is:`
3. `UserRegistry` – `UserRegistry` holds information about roles associated with a `User` (let's assume that `User` is uniquely identified by `name`). Create a class that gives you possibility to add/remove roles from the user. It should also be possible to check if given user has given role.

POLYMORPHISM