Workshop 9 (Week 10) – Code Review

The purpose of this workshop is to practice and develop an understanding of code review.

1. Concepts

1) What is software review?
2) Describe different types of code review.
3) Describe benefits and limitations of code review.

2. Bug Patterns

Describe the common problems associated with the following code:

- a/b
- a.field
- a[x]
- p.malloc()
- lock(s)
- while(x<0)
- <script> xxx </script>

3. Code Review – An Exercise

Identify potential problems associated with the following code:

1)

```
public static void switchCasePrimer() {
        int caseIndex = 0;
        switch (caseIndex) {
                case 0:
                System.out.println("Zero");
                case 1:
                System.out.println("One");
                break;
                case 2:
                System.out.println("Two");
                break;
                default:
                System.out.println("Default");
        }
}
```

2)

```
private static void printFileJava7() throws IOException {
    try(FileInputStream input = new FileInputStream("file.txt")) {
        int data = input.read();
        while(data != -1){
            System.out.print((char) data);
            data = input.read();
        }
    }
}
```

3)

```
List<String> accountIds = person.getAccountIds();
for (String accountId : accountIds) {
    processAccount(accountId);
}
```

4)

```
selfie = person.shootASelfie();
try {
    selfie.show();
} catch (NullPointerException e) {
}
```

5) **Feature Envy Code Smell**

```
class User
{
    private $contactInfo;

    public function __construct()
    {
        $this->contactInfo = new ContactInfo();
    }

    public function getFullAddress()
    {
        $address = $this->contactInfo->getStreetName();
        $address .= ' ' . $this->contactInfo->getStreetNumber() . ', ';
        $address .= $this->contactInfo->getZipCode() . ', ';
        $address .= $this->contactInfo->getCity() . ', ';
        $address .= $this->contactInfo->getCountry();

        return $address;

    }
}
```

6) **Temporary Fields Code Smell**

```php
class User
{
    private $id;
    private $name;
    private $priviledges;
    private $content;
    private $contactDetails;

    public function __construct()
    {
        $this->contactDetails = new UserContactDetails();
    }
    function notify($message)
    {
        $messageBody = 'Dear ' . $this->name;
        $messageBody .= '( ' . $this->contactDetails->getStreetNumber() . ' ' .
            $this->contactDetails->getStreetName() . ').';
        $messageBody .= $message;
        $notificationService->sendSMS($this->contactDetails->getPhoneNubmer(), $messageBody);
    }
    function delete()
    {
        systemDelete($this->id);
    }

    function update() {
        systemUpdate($this->id, $this->priviledges, $this->content);
    }
```

7) **Primitive Obsession Code Smell**

```php
class contactUs
{
    public function addressUsa()
    {
        $address = new Array();
        $address['streetNo'] = 2074;
        $address['streetName'] = 'JFK street';
        $address['zipCode'] = '507874';

        return $address['streetName']. ' '. $address['streetNo']. ', '. $address['zipCode'];
    }

    public function addressGermany()
    {
        $address = new Array();
        $address['streetNo'] = '25';
        $address['streetName'] = 'Frankfurter str.';
        $address['zipCode'] = '80256';

        return $address['streetName']. ' '. $address['streetNo']. ', '. $address['zipCode'];
    }

    public function hotLine(){
        return '+49 01687 000 000';
    }
}
```

4. FindBugs

As described in the lecture, FindBugs is a widely used static bug detection tool. In this workshop you will download and try out FindBugs:

- Download and install the FindBugs tool from http://findbugs.sourceforge.net/.
- Apply FindBugs to detect bugs/issues in your Assignment 1 submission (or other Java programs you wrote before).
- Report the bugs/issues identified by FindBugs. How many of them are actual problems and how many of them are false alarms?