**Exceptions Lab**

This lab contains exercises related to Exceptions, and overriding methods of the Object Class.

Start Eclipse IDE. Create a new Java project named **Week4-Project,**and complete the following tasks:

**Task 1: Handling unchecked exceptions**

Create a class named ***TestUncheckedException*** with the following code:

**public** **class** TestUncheckedException {

**public** **static** **void** test(**int** num) {

**int** x = 10;

**int**[] ia1 = **null**, ia2 = **new** **int**[2];

**if** (num == 0) {

                        x = 20 / num;

                  } **else** **if** (num == 1) {

                        x = ia1.length;

                  } **else** **if** (num == 2) {

                        x = ia2[2];

                  } **else** {

                        x = num;

                  }

      }

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

            System.***out***.println("Please enter 0, 1, 2 or any other number: ");

            java.util.Scanner sc = **new** java.util.Scanner(System.***in***);

*test*(sc.nextInt());

      }

  }

Create exception handlers to catch the exceptions and print out what exception is caught in each case. Make sure the value of variable x is always printed.

**Task 2: Handling checked exceptions**

Create a class named ***TestCheckedException***with the following code:

**import** java.awt.Desktop;

**import** java.io.IOException;

**import** java.net.URI;

**import** java.net.URISyntaxException;

**public** **class** TestCheckedException {

**public** **static** **void** test1(String myURL) {

            URI uri = **new** URI(myURL);

**if** (Desktop.*isDesktopSupported*()) {

                  Desktop.*getDesktop*().browse(uri);

            }

      }

**public** **static** **void** test2(String myURL) {

            URI uri = **new** URI(myURL);

**if** (Desktop.*isDesktopSupported*()) {

                  Desktop.*getDesktop*().browse(uri);

            }

      }

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

            System.***out***.println("Please enter an URL (e.g. https://ict.senecacollege.ca/): ");

            java.util.Scanner sc = **new** java.util.Scanner(System.***in***);

            String url = sc.nextLine();

*test1*(url);

*test2*(url);

      }

}

The file is not compiled because of the possible checked exceptions which are not handled. Update the code of method ***test1*** to handle the check exception(s) using the “catch” approach; update the code of method ***test2*** to handle the check exception(s) using the “specify” approach.

**Task 3: Creating custom (user-defined) exception**

Create a user-defined exception named ***UnexpectedUserInputException***in the project.

Update the ***TestUncheckedException*** class in the Task 1. If the number user input is not one of the integers: 0, 1 or 2, the ***test*** method should throw an exception of ***UnexpectedUserInputException*.** Then, handle the exception in the main method.

**Task 4: Creating classes with overriding methods**

Create a ***Course*** class that has a name, an id, and a description. Create a ***Book*** class that has a name, ISBN and price. The Course must have a field data of type array of ***Book***. Create constructors, getters and setters for the two classes, and override the toString(), equals(), hashCode() and clone() methods.