



Fall 2014

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## CSC 245: Objects and Data Abstraction

Lab2

### Exercise One

Create a new class `ListOfNumbers` with the following code:

```
import java.io.*;
import java.util.List;
import java.util.ArrayList;

public class ListOfNumbers {

    private List<Integer> list;
    private static final int SIZE = 10;

    public ListOfNumbers () {
        list = new ArrayList<Integer>(SIZE);
        for (int i = 0; i < SIZE; i++) {
            list.add(new Integer(i));
        }
    }
    public void writeList() {

        PrintWriter out = new PrintWriter(new FileWriter("OutFile.txt"));

        for (int i = 0; i < SIZE; i++) {

            out.println("Value at: " + i + " = " + list.get(i));
        }
        out.close();
    }
}
```

If you try to compile the `ListOfNumbers` class, the compiler prints an error message about the exception thrown by the `FileWriter` constructor. However, it does not display an error message about the exception thrown by `get(i)`. The reason is that the exception thrown by the constructor, `IOException`, is a checked exception, and the one thrown by the `get` method, `IndexOutOfBoundsException`, is an unchecked exception.

- a) Enclose the exception-throwing statements of the writeList method within a try block.
- b) Associate an exception handler with the placed try block.

First catch an IndexOutOfBoundsException and include the following in its body:

```
System.err.println("IndexOutOfBoundsException: " + e.getMessage());
```

Second catch an IOException and include the following in its body:

```
System.err.println("Caught IOException: " + e.getMessage());
```

- c) Include a finally statement that cleans up by closing the PrintWriter and prints the string "PrintWriter closed".
- d) Specify in its header that the WriteList method throws these two exceptions

## Exercise Two

- a) Design and implement a program that creates an exception class called StringTooLongException, designed to be thrown when a string is discovered that has too many characters in it. This exception should print an appropriate message informing the user that the entered string has too many characters. In the main driver of the program, read strings from the user until the user enters "DONE". If a string is entered that has too many characters (say 20), throw the exception.
- b) Design an identical class that handles the exception using try and catch blocks. Handle the exception by printing an appropriate message, and then continue processing more strings.

## Exercise Three

Design and implement a program that creates an exception class called InvalidDocumentCodeException, designed to be thrown when an improper designation for a document is encountered during processing. Suppose in a particular business, all documents are given a two-character designation starting with either U, C, or P, standing for unclassified, confidential, or proprietary. If a document designation is encountered that doesn't fit that description, an exception is thrown. Create a driver program to test the exception, allowing it to terminate the program.