Introduction to Java

CS9053

Thursday 6:00 PM – 8:30 PM

Prof. Dean Christakos

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Due: June 30th, 2023 11:55 PM

Part I: Exceptions

1. In the class ReadShapeFile, there is a file called shapes.txt. I’ve opened it on line 21. This has a list of shapes. You’re going to read each line for each shape and call createShape, which will create one of the available shapes, Circle, Rectangle, or Square and returns a GeometricObject, which you will add to the ArrayList called shapeList.

The file has some unavailable shapes. If the shape is unavailable, createShape should throw a ShapeException. You should catch a ShapeException and continue reading the file.

By the end, the side of shapeList should be 20.

Summary:

* Create a ShapeException class
* Implement createShape to return the appropriate shape depending on the string shapeName
* createShape should throw a ShapeException if it is not a Circle, Square, or Rectangle
* A loop should read in the shapes.txt file line-by-line
* If the file cannot be read, you should break out of the loop
* If you get a ShapeException, you should continue reading the file

1. Take the following code, ListOfNumbers.java:

import java.io.\*;

import java.util.List;

import java.util.ArrayList;

public class ListOfNumbers {

private List list;

private String inFile;

public ListOfNumbers () {

// create an ArrayList of RDFTriples of Integers

}

public List getList() {

return this.list;

}

public void createList() {

for (int i = 0 ; i< 100 ; i++) {

Integer number1 = (int) (Math.*random*()\*10000);

Integer number2 = (int) (Math.*random*()\*10000);

Integer number3 = (int) (Math.*random*()\*10000);

// fill the existing list with RDFTriple objects

// of three numbers.

}

}

public ListOfNumbers (String inFile) {

this();

this.inFile = inFile;

}

public void readList() {

}

public void writeList() {

PrintWriter out = null;

try {

System.*out*.println("Entering try statement");

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

for (int i = 0; i < list.size(); i++)

out.println(list.get(i).getSubj() + " " + list.get(i).getPred() + “ “ + list.get(i).getObj());

} catch (IndexOutOfBoundsException e) {

System.*err*.println("Caught IndexOutOfBoundsException: " +

e.getMessage());

} catch (IOException e) {

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

} finally {

if (out != null) {

System.*out*.println("Closing PrintWriter");

out.close();

} else {

System.*out*.println("PrintWriter not open");

}

}

}

}

You’re going to do a couple of things:

1. You can see the class “RDFTriple”. Now, this takes three Objects, a subject, a predicate, and an object. Like ArrayList, it’s parameterized. So you can have an RDFTriple with a subject of a String, a predicate of Integer, and an Object of a Car, like RDFTriple<String, Integer, Car>, or an RDFTriple of integers where they subject, predictate, and object are Integers, such as RDFTriple <Integer, Integer, Integer>. You would access each item of the RDF triple with getSubj(), getPred(), and getObj().

For example, I could create an RDFTriple of 5, 6, and 7 like so:

RDFTriple<Integer, Integer, Integer> t = new RDFTriple<Integer, Integer, Integer>(5,6, 7);

Here, t.getSubj() would be 5, t.getPred() would be 6, and t.getObj() would be 7

What you’re going to do first is have the field rdfTripleList be an ArrayList of RDFTriple objects, properly parameterized (there should be no warnings associated with ArrayList in the code).

Next, you’re going to implement createList. Currently in createList, you can see that it generates three random integers between 0 and 9999. You’re going to take each triple of integers and put them in an RDFTriple object, and then add that RDFTriple object to the ArrayList called rdfTripleList.

So at this point rdfTripleList should have 100 RDFTriple objects, where each object contains a Key and a Value of random integers. Once you’ve done this, the method writeList should compile correctly without errors (you shouldn’t have to modify that code directly for the errors to go away).

1. Add a readList method to ListOfNumbers.java. This method should re-initialize the rdfTripleList field with a new, empty ArrayList, read in int values from a file, print each value, put the triple of numbers in each line in a RDFTriple object, and append them to the end of rdfTripleList. You should catch all appropriate errors. You will read from the text file numberfile.txt.

There’s a trick when reading in data that you want to split up. If you read in a line, it will contain two numbers separated by a space, and you will have a String that looks like “5 6 7”. Call it line, which is a String object. If you execute the method line.split(), it will return an array of Strings such that if you have String[] nums = line.split(), then nums[0] will be the String “5”, nums[1] will be the String “6”, and nums[2] will be the String “7”. Convert those Strings to Integers and use those integers in the constructor to your RDFTriple object, and add the RDFTriple object to the ArrayList.

The writeList method writes out the contents of the ArrayList to outFile.txt.