

Programming Fundamentals

Lab #5

Topics

- Exceptions
- File I/O
- Recursion

Concepts

try...catch statement

throws declaration

checked vs. unchecked exceptions

File class, input/output streams

FileWriter, BufferedWriter, PrintWriter classes

recursive methods

Euclid's greatest common divisor algorithm

recursive string reversal

Exercise 1

a) Create a text file called "input.csv" which contains the following three lines of numbers, separated by commas:

```
1,4,6,7,8  
2,3,1,5,6  
3,2,1,4,5
```

b) Write a program that reads the file you created (make sure it's in the right folder) and outputs to the screen the largest number in each row. The output should look like this:

Maximum values

```
ROW 1: 8  
ROW 2: 6  
ROW 3: 5
```

Exercise 2

Write a program that reads strings from the user and writes them to an output file called `userStrings.txt`. Terminate processing when the user enters the string "DONE". Do not write the sentinel string to the output file.

Exercise 3

Design and implement a program that implements Euclid's algorithm for finding the greatest common divisor of two positive integers. The greatest common divisor is the largest integer that divides both values without producing a remainder. In a class called `DivisorCalc`, define a static method called `gcd` that accepts two integers, `num1` and `num2`. Create a driver program inside the `main` method to test your implementation. The recursive algorithm is defined as follows:

```
gcd(num1, num2) is num2 if num2 <= num1 and num2 divides num1  
gcd(num1, num2) is gcd(num2, num1) if num1 < num2  
gcd(num1, num2) is gcd(num2, num1%num2) otherwise
```

Exercise 4

Create a class called `StringReversal`. Inside of it, create a recursive method called `reverseString` that accepts a `String s` and returns a new `String` which is `s` in reverse order. Create a driver program inside the `main` method to test your implementation.