

### Problem A

Write a program that creates a ***Calculator*** class.

#### Calculator class:

The class contains 2 *variables* of integer type.

Design a *constructor* that accepts two values as parameters and sets those values.

Design four methods named *Add()*, *Subtract()*, *Multiplication()*, *Division()* for performing +, -, \* and / of two numbers.

#### Exceptions:

For addition and subtraction, two numbers should be positive(+). If any negative number is entered then throw an exception in respective methods. Design an exception handler(ArithmeticException) in *Add()* and *Subtract()* methods respectively to check whether any number is negative or not.

For division and multiplication two numbers should not be zero. If zero is entered for any number then throw an exception in respective methods. So design an exception handler (ArithmeticException) in *Multiplication()* and *Division()* methods respectively to check whether any number is zero or not.

#### Main class:

Write a main class and declare *four objects* of Calculator class. Perform addition (obj1), subtraction (obj2), multiplication (obj3) and division (obj4) operations for these objects.

If any non-integer values are provided as input; then you should throw an exception (NumberFormatException) and display a message that informs the user of the wrong input before exiting.

## Problem B

Create ***readFile(String filename)*** method.

In this method you are passed a *String* with the *name* of a file. This method will read the file in line by line and store each line in a *String array*. This *String array* is then returned. An example is shown below.

**File Contents (text.txt):**

```
Purple Rain by Prince
I never meant to cause you any sorrow
I never meant to cause you any pain
I only wanted one time to see you laughing
I only want to see you laughing in the purple rain
```

**String Array Contents:**

```
[0]: Purple Rain by Prince
[1]: I never meant to cause you any sorrow
[2]: I never meant to cause you any pain
[3]: I only wanted one time to see you laughing
[4]: I only want to see you laughing in the purple rain
```

In order to do this, you will need:

- a *String array*
- an *int* that keeps track of how many lines there are in a file
- a *File Object*
- a *Scanner Object*

Assume that the *String array* holds a max of 1000 elements. Your *String array* is named *lines* and the *int* that keeps track of the amount of lines is named *lineCounter*. You will loop through and parse this file with the use of the *Scanner* and *File Object* and store each line in the *String array* while also counting each line.

### Problem C

Create a short text file (approximately 10 lines). Create a Java program called *SimpleIO.java*

The program should ask the user for an input file (the text file you created in the first step), and should make sure this file exists and is not a directory.

It should keep asking the user for input until an existent file is given.

Next, the program should ask for another file name, for output. This file does not need to exist, but it must be a distinct name from the input file. Keep asking until this condition is satisfied.

Read the input file, line by line, and count the occurrences of the word "the" in each line.

**Hint:**

Split the string into an array of lowercase words.

For each line of input, you should print the line in the output file, followed by the number of occurrences of "the".

For example, if the input line is "The cat and the dog", the output line should be "The cat and the dog [2]"