CS 1181 - Computer Science II

Practice Problem: Exceptional Square

Purpose: To become familiar with throwing and catching exceptions.

Part A:

Your task is to write a class called Square. Your class should have the following fields and methods:

- private double side
- public Square – constructor that initializes the side of this object
- public String toString – returns a String of the form "Square with side = `side`"
- public double getPerimeter() – returns the perimeter of the square
- public double getArea() – returns the area of the square

You also need to create a class called Driver.java with a main method. In main:

- Prompt the user with the statement "Enter the length of the square's side: "
- Read in the user's response. If the user enters a negative value or something that is not a number, your program may crash. This is OK for now.

Part A example output:

```
Enter the length of the square's sides: 2
Square with side = 2.0
The perimeter of the square is 8.0
The area of the square is 4.0
```

Part B:

Improve your Square class as follows:

- public Square – Your constructor should now should throw a custom exception called NegativeLengthException if the side argument is negative. The message of this exception should be "Negative length: `side`"

Update the main method in Driver.java so that it behaves as follows:

- Prompt the user with the statement "Enter the length of the square's side: "
- Read in the user's response. If the user enters something that is not a number, catch the associated exception and display the message "Error: you must enter a number" to standard error.
- Create a square object, call its toString method and display its perimeter and area. If a NegativeLengthException occurs, display the associated message to standard error.

Part B example output:

```
Enter the length of the square's sides: 2
Square with side = 2.0
The perimeter of the square is 8.0
The area of the square is 4.0
Enter the length of the square's sides: -2
Negative length: -2.0
Enter the length of the square's sides: bob
Error: you must enter a number
```