Assignment 2

Due: 3/6

Submission Instructions

- Zip all your files (code, README, written answers, etc.) in a zip file named $\{firstname\}\_\{lastname\}\_CS5950\_HW2.zip$ and upload it to Blackboard

1. (5 points) Implement the factorial function using *to* and *reduceLeft*, without a loop or recursion.

2. (10 points) Write a Scala program to find the prime number from an array of numbers and print them.

3. (15 points) Write a Scala code which reads a file and reverse the lines (makes the first line as the last one, and so on). Write the reversed file to a new file named "reversed.txt" at the same location.

4. (15 points) Write a Scala code which reads a file and prints all words with more than 10 characters. Can you write all of it in a single line?

5. (20 points) Write a Scala program to implement QuickSort function. Choose an array of your choice and check the result.

6. (15 points) In mathematics, The Least Common Multiple (LCM) of two numbers is the smallest positive integer that can be divided by the two numbers without producing a remainder. LCM can be calculated as follows:

$$LCM(a, b) = \frac{a * b}{GCD(a, b)}$$

   where $GCD(a, b)$ is the Greatest Common Divisor of a and b, i.e., the largest number that divides both of them without leaving a remainder. Write a Scala program to implement a function to calculate $LCM(a, b)$ using Higher Order Functions.

7. (20 points) OOP with Scala

   (a) Write a class BankAccount with methods *deposit* and *withdraw*, and read-only property *balance*. Provide customized getter and setter to check the validity of value of *balance*, e.g., *balance* can only be initialized with an amount ≥ 0. Write a main function to test your class.

   (b) Extend your BankAccount class to a CheckingAccount class that charges $1 for every *deposit* and *withdraw*. Write a main function to test your CheckingAccount class.