CS201 Project 1

Long Int Arithmetic Using Linked Lists

Please read the important notes part at the end carefully.

Project Description:

In this project, you will implement a program that can execute arithmetic operations on large numbers. With two large numbers, you will implement addition, subtraction, multiplication, and division. The expected output format is a string containing only the decimal numbers. The code can **only be written and be submitted to the github during the lab hours.** However, you can practice and research outside the lab hours.

Week 1 Lab Session

In the first weeks lab session, you will give us a prototype of your project design including only the required method signatures (method name, parameters without body) with clear comments written for each of the methods and attributes you will implement.

Week 2 Lab Session

In the second weeks lab session, you will implement addition. **Make sure to cover the cases where the input lengths do not match.** The large numbers are represented as a linked list with one digit in every node. You must do the arithmetic operation with the linked list. The expected output format is a string containing only the decimal numbers. Make sure to print out the sum of the two strings on the console.

Week 3 Lab Session

In the third weeks lab session, you will implement substraction. Make sure to cover the cases where the input lengths do not match. The large numbers are represented as a linked list with one digit in every node. You must do the arithmetic operation with the linked list. The expected output format is a string containing only the decimal numbers. Make sure to print out the subtraction result of the two strings on the console.

Week 4 Lab Session

In the fourth weeks lab session, you will implement multiplication. Make sure to cover the cases where the input lengths do not match. The large numbers are represented as a linked list with one digit in every node. You must do the arithmetic operation with the linked list. The expected output format is a string containing only the decimal numbers. Make sure to print out the multiplication of the two strings on the console.

Week 5 Lab Session

In the fifth weeks lab session, you will implement division. **This time however, you are expected to divide a large number with a single digit number.** The large numbers are represented as a linked list with one digit in every node. You must do the arithmetic operation with the linked list. The expected output format is a string containing only the decimal numbers. Make sure to print out the divided value of the two strings on the console. **The expected is the quotient (remember the division over the int values, example: 10 / 4 = 2).**
Bonus: division of two large numbers instead of one large one single digit.

Project Structure:

- You will use the Java programming language in this project.
- You must use the following GitHub assignment, and create a repository for this project: https://classroom.github.com/a/rzowWzkL

IMPORTANT NOTES:

- You must come to the lab to be graded for your work.
- You MUST accept the Github assignment with your name only. Those that can not be verified will receive 0.
- External library usage is forbidden
- The code can **only be written and be submitted to the github during the lab hours.** However, you can practice and research outside of the lab hours.
- You must use linked lists for the arithmetic operations.

P.S.: If you have further questions, don't hesitate to contact me by email (ozan.tarlan@ozu.edu.tr). Good luck!