Cairo University, Faculty of Computers and Artificial Intelligence

FACULTY OF COMPUTERS AND AI, CAIRO UNIVERSITY

CS213: Object Oriented Programming Fall 2023

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First Semester

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- isValidReal(string s) Function:

Initialize two counters, valid and sign, to 0.

Iterate through each character in the input string s.

Check if the character is a '.', an alphabet character ('a' to 'z'), '+', or '-'. Increment the corresponding counter (valid or sign) if it matches.

If there are more than one valid characters (valid > 1) or more than one sign characters (sign > 1), return 0, indicating an invalid real number. Otherwise, return 1.

- operator+ (BigReal num2) Function:

This function performs addition of two BigReal objects.

Initialize boolean variables dot1 and dot2 to check if the two numbers have a decimal point.

Initialize boolean variables neg1 and neg2 to check if the numbers are negative.

Handle positive or negative signs and ensure that the numbers have the same number of digits before and after the decimal point.

Perform addition for integers, fractions, or a combination of both.

Handle carries during addition, and adjust the position of the decimal point.

Return the result in a new BigReal object.

- operator- (BigReal num2) Function:

This function performs subtraction of two BigReal objects.

Determine the presence of a decimal point and negative signs in both numbers.

Adjust the numbers to have the same number of digits before and after the decimal point.

Perform subtraction, considering cases of both numbers being positive or negative.

Remove leading zeros and add a '-' sign if necessary.

Return the result in a new BigReal object.

- operator< (BigReal num2) Function:

This function checks if one BigReal object is less than another.

Determine the number of digits before and after the decimal point in both numbers.

Compare positive numbers and their fractional parts.

Handle cases where both numbers are positive or negative.

Return 1 if the first number is less than the second, otherwise return 0.

- operator> (BigReal num2) Function:

This function checks if one BigReal object is greater than another using the operator< function and negation.

- operator== (BigReal num2) Function:

This function checks if two BigReal objects are equal by comparing each character in their strings.

These algorithms provide a high-level overview of the functionality in the code, but they omit some details like the alignDecimalPoints and removeLeadingZeros functions, which are used within the code.

Name (ID)	Solved parts
Yousef Waleed Sayed (20221206)	**+operator and ValidReal function**
Sherif Mahmoud (20221080)	**-operator and ==operator**
Mohamed Taha (20221123)	**<operator and >operator**