

Cairo University

Faculty of Computers and Artificial Intelligence



CS213

Programming II

Assignment 2

Project Description

2023

Dr. Mohamad El-Ramly

Team members

Name	ID	Section
Mohanad Abdullrahem Abdullrahman	20220348	S2
Ahmed Ehab Shehata Ali	20220012	S1
Ahmed Mohamed Amer Ahmed	20220034	S1

Algorithm of +:

Check that the sign of two BigReals is equal.

If they equal.

If the fraction part size is not equal in the two numbers.

The program store the digits of the that make the fraction part size is bigger than the other.

It iterate digit by digit from right to left and add the two corresponding digits in the fraction and the carry if the carry value is one.

If the result of adding is bigger than 9, the method subtract 10 from result of adding and store the result and set carry to 1.

The method redo steps from 3 to 6 for integer part expect 4.

Instead of step 4, the program pad smaller integer size by zeros from the left.

The method make an object from the result string and return the result.

If the sign of two numbers is not equal.

The method make a copy of the objects and change sign of the negative number and make it the second number if the negative number is the first.

The method call the subtract method and return the result.

Algorithm of -:

First we make sure that all 3 parts of BigReal number are not empty and make 2 BigReal variable to store the values.

Then we check the sign of the two BigReal variable

If the sign of them are not the same

 We call +operator after change the second variable sign

Else

 We do the operation on them as follow

First we compare integer sizes of them to know which is bigger

If first is the bigger

the result sign = first sign

Else if the second is the bigger

The result sign = the inverse of second

Else if the size is same

We compare every index value by loop on the integer part and if integer part is the same in the two variable , we compare fraction part by value that stored in the index and bigger value become the bigger one.

After we knowed which is bigger we save the bigger in "result"

BigReal obj and the lower in "second" BigReal obj.

Now to do the '-' operation we make sure that fraction parts is the Same size in the two variable if it was not by adding zeros to the End of the lower fraction.

We subtract every index value in the lower from the bigger from The right to left and if the result was less than '0' we add 10 and Subtract one from the previous index and if the index was 0 and We need to add 10 we subtract from integer part.

We do the same operation on the integer part but we add zeros to The beginning of the string of the integer part.

After doing all this we remove all useless zeros from right and left By looping on the integer and fraction parts.

Algorithm of <:

First we check for the sign:

If the first real is – and the second is +

Return true

Else if the first real is + and the second is -

return false

else if both are –

we call the > operator without the signs

second we check for the integer part:

if the size of the first one is < the second

return true

else if the size of the first is > the second

return false

else if both are equal

we loop and check for each digit

if the first < the second

return true

else if first > second

return false

third we check the fraction part

we loop and check for each digit

if the first < the second

return true

else if first > second

return false

if we finish the loop we check if the size of the first one < the second one

return true

else

return false

Algorithm of >:

First we check for the sign:

 If the first real is – and the second is +

 Return false

 Else if the first real is + and the second is -

 return true

 else if both are –

 we call the > operator without the signs

second we check for the integer part:

 if the size of the first one is < the second

 return false

 else if the size of the first is > the second

 return true

 else if both are equal

 we loop and check for each digit

 if the first < the second

 return false

 else if first > second

 return true

third we check the fraction part

 we loop and check for each digit

 if the first < the second

 return false

 else if first > second

 return true

if we finish the loop we check if the size of the first one < the second one

return false

else

return true

Algorithm of isValidReal:

We use regular expression to validate the input

We have 3 regular expressions:

One for numbers without integer part

one for numbers without fraction part

one to check for the alphabetic

if the input matches the regular expression

return true

else return false

Who did what in Task 1:

Name	Solve Problems
Mohanad Abdullrahem	3, 6, 9 and 12 In task 1
Ahmed Ehab Shehata	1, 4, 7 and 10 In task 1
Ahmed Mohamed Amer	2, 5, 8 and 11 In task 1

Who did what in BigReal:

Name	Part done
Mohanad Abdullrahem	BigReal(string realNumber) Void setNum(string realNumber) String getNum() Char getSign() Bool operator>(BigReal anotherReal) Bool operator==(BigReal anotherReal)
Ahmed Ehab Shehata	BigReal (double realNumber = 0.0) BigReal operator+(BigReal& other) Friend ostream &operator<<(ostream &out, BigReal num) Void setSign(char sign)
Ahmed Mohamed Amer	BigReal operator-(BigReal& other) BigReal(const BigReal& other) BigReal &operator=(BigReal &other) Int getSize() Bool operator<(BigReal anotherReal)

Github :

	<div>adding default copy constructor</div> <div>Ahmed-Amer01 committed 2 days ago</div> <div>b022b88</div> <div><></div>
	<div>Merge pull request #4 from AhmedEhab2022/hello ...</div> <div>Ahmed-Amer01 committed 2 days ago</div> <div>Verified</div> <div>660c90b</div> <div><></div>
	<div>add = operator and improve cout fun</div> <div>Ahmed-Amer01 committed 2 days ago</div> <div>04d875a</div> <div><></div>
	<div>Merge pull request #3 from AhmedEhab2022/task2 ...</div> <div>Ahmed-Amer01 committed 2 days ago</div> <div>Verified</div> <div>fe23340</div> <div><></div>
	<div>adding - operator</div> <div>Ahmed-Amer01 committed 2 days ago</div> <div>54a1fd3</div> <div><></div>
Commits on Oct 30, 2023	
	<div>Merge pull request #2 from AhmedEhab2022/prob11 ...</div> <div>Ahmed-Amer01 committed last week</div> <div>Verified</div> <div>99760e8</div> <div><></div>
	<div>add problem 11</div> <div>Ahmed-Amer01 committed last week</div> <div>0f0a826</div> <div><></div>
Commits on Oct 28, 2023	
	<div>Merge pull request #1 from AhmedEhab2022/task1 ...</div> <div>Ahmed-Amer01 committed last week</div> <div>Verified</div> <div>0339c86</div> <div><></div>
	<div>add problem 2 , 5</div> <div>Ahmed-Amer01 committed last week</div> <div>8e9028f</div> <div><></div>
Commits on Nov 4, 2023	
	<div>Merge branch 'main' of https://github.com/AhmedEhab2022/OOP_Assignment_2 ...</div> <div>AhmedEhab2022 committed yesterday</div> <div>a2d8f2c</div> <div><></div>
Commits on Nov 3, 2023	
	<div>Merge branch 'main' of https://github.com/AhmedEhab2022/OOP_Assignment_2 ...</div> <div>AhmedEhab2022 committed 3 days ago</div> <div>ca04219</div> <div><></div>
	<div>add test case for copy constructor</div> <div>AhmedEhab2022 committed 3 days ago</div> <div>6ce5ec2</div> <div><></div>
Commits on Nov 2, 2023	
	<div>edit '<<' opreator overloading, add destructor and add test cases in ...</div> <div>AhmedEhab2022 committed 3 days ago</div> <div>8b209a6</div> <div><></div>
	<div>add default constructor and '+' opereator overloading</div> <div>AhmedEhab2022 committed 3 days ago</div> <div>273c087</div> <div><></div>
Commits on Nov 1, 2023	
	<div>add operator << overloading</div> <div>AhmedEhab2022 committed 4 days ago</div> <div>9b75c89</div> <div><></div>
Commits on Oct 31, 2023	

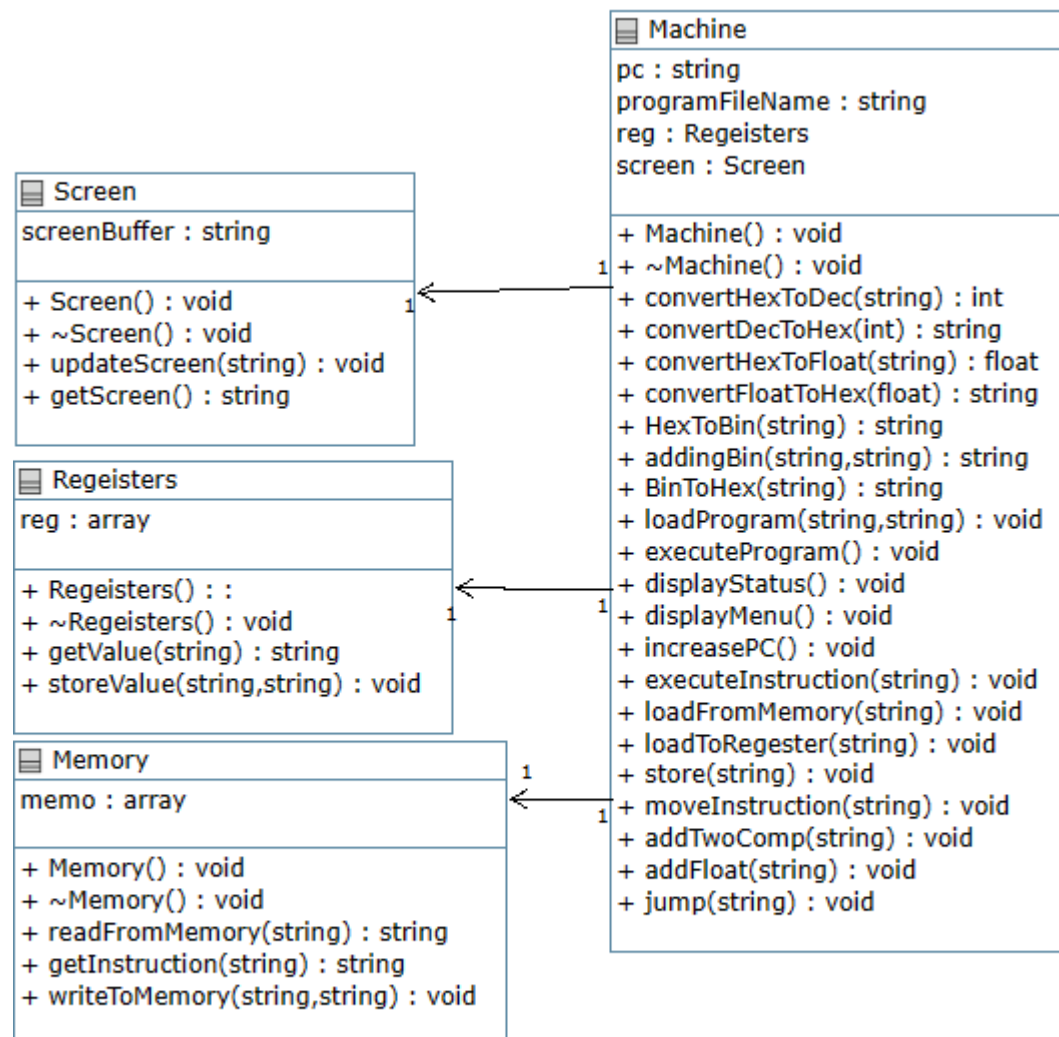
add int to validator mohanad-80 committed 2 days ago				eab2367	
Commits on Nov 3, 2023					
fix comparison operators mohanad-80 committed 2 days ago				c302979	
add the case of chars to the validator mohanad-80 committed 2 days ago				b72699a	
remove debug code mohanad-80 committed 2 days ago				322d518	
fix validator mohanad-80 committed 2 days ago				12cacb7	
add number to error msg mohanad-80 committed 2 days ago				707b1ac	
Commits on Nov 2, 2023					
Merge branch 'main' of https://github.com/AhmedEhab2022/OOP_Assignment_2 ... mohanad-80 committed 3 days ago				8362332	
test mohanad-80 committed 3 days ago				Fa70269	
comment some errors mohanad-80 committed 3 days ago				434e249	

Who did what in Machine Simulator:

Name	Part done
Mohanad Abdullrahem	display status() display menu() getScreen() getMemory() getRegeister() executeInstruction(string instruction) store(string instruction) writeToMemory(string data, string address) updateScreen(string data) addFloat(string instruction) convertHexToFloat(string hexNum) convertFloatToHex(float num)
Ahmed Ehab Shehata	convertHexToDec(string hexNum) loadProgram(string fileName, string address) loadFromMemory(string instruction) moveInstruction(string instruction) jump(string instruction) increasePC() getValue(string address) storeValue(string data, string address)
Ahmed Mohamed Amer	readFromMemory(string address) getInstruction(string address) convertDecToHex(int decNum) executeProgram() loadToRegester(string instruction) addTwoComp(string instruction)

	<div>HexToBin(string Hex) addingBin(string bin1 , string bin2) BinToHex(string Bin)</div>
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UML for the Machine Simulator:



Github repo for the machine simulator:

The screenshot shows the main page of a GitHub repository named 'AhmedEhab2022/OOP_Assignment_2'. The repository is private and has 1 watch, 0 forks, and 0 stars. The main branch is 'main', and there are 5 branches and 0 tags. The repository has 100 commits, with the most recent commit by 'mohanad-80' titled 'modifie display status' 13 hours ago. The repository contains files 'Task_1', 'Task_2', 'Task_3', and '.gitignore'. A button 'Add a README' is visible. The right sidebar shows sections for 'About', 'Activity', 'Releases', 'Packages', and 'Contributors'.

AhmedEhab2022 / OOP_Assignment_2

main 5 branches 0 tags

Go to file Add file <> Code

mohanad-80 modifie display status 6d47434 13 hours ago 100 commits

Task_1 edit problem 1 last week

Task_2 add comment on =operator and copy constructor 3 days ago

Task_3 modifie display status 13 hours ago

.gitignore add task 3 last week

Help people interested in this repository understand your project by adding a README. Add a README

About

No description, website, or topics provided.

Activity

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

No packages published

Publish your first package

Contributors 3

AhmedEhab2022 Ahmed Ehab

The screenshot shows the 'Branches' page of the same GitHub repository. It displays the default branch 'main' and a list of other branches: 'test', 'Hello', 'teamMember1', and 'edit'. Each branch shows its commit count, the user who updated it, and a 'Merged' button. The 'test' branch has 22 commits and was updated 3 days ago by 'mohanad-80'. The 'Hello' branch has 5 commits and was updated 3 days ago by 'Ahmed-Amer01'. The 'teamMember1' branch has 12 commits and was updated 3 days ago by 'AhmedEhab2022'. The 'edit' branch has 21 commits and was updated 4 days ago by 'AhmedEhab2022'.

Branches · AhmedEhab2022/OOP_Assignment_2

Search branches...

Overview Yours Active Stale All branches New branch

Default branch

main Updated 13 hours ago by mohanad-80 Default

Your branches

test Updated 3 days ago by mohanad-80 22, 0 #17 Merged

Active branches

Hello Updated 3 days ago by Ahmed-Amer01 5, 0 #22 Merged

teamMember1 Updated 3 days ago by AhmedEhab2022 12, 0 #19 Merged

test Updated 3 days ago by mohanad-80 22, 0 #17 Merged

edit Updated 4 days ago by AhmedEhab2022 21, 0 #15 Merged

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AhmedEhab2022 / OOP_Assignment_2

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<> Code Issues Pull requests 1 Actions Projects Security Insights

Commits

main ▾

Commits on Nov 13, 2023

Merge pull request #22 from AhmedEhab2022/Hello ...
AhmedEhab2022 committed 2 days ago

Verified 624735d <>

Merge pull request #21 from AhmedEhab2022/machine ...
AhmedEhab2022 committed 3 days ago

Verified 712a189 <>

Merge pull request #20 from AhmedEhab2022/excute ...
AhmedEhab2022 committed 3 days ago

Verified 3fd1786 <>

Commits on Nov 12, 2023

add IncreasePC and uncomment some lines of codes
AhmedEhab2022 committed 3 days ago

4d74603 <>

Merge pull request #18 from AhmedEhab2022/addTask ...
AhmedEhab2022 committed 3 days ago

Verified ac5206f <>

Merge pull request #17 from AhmedEhab2022/test ...
AhmedEhab2022 committed 3 days ago

Verified 81026b1 <>

Merge pull request #16 from AhmedEhab2022/test ...
AhmedEhab2022 committed 3 days ago

Verified d468cb8 <>

Commits on Nov 11, 2023

AhmedEhab2022 / OOP_Assignment_2

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<> Code Issues Pull requests 1 Actions Projects Security Insights

Commits

main ▾

Commits on Nov 13, 2023

add comment on =operator and copy constructor
Ahmed-Amer01 committed 3 days ago

97f050b <>

fix DecToHex
Ahmed-Amer01 committed 3 days ago

c6a2dda <>

excute
Ahmed-Amer01 committed 3 days ago

e3fe736 <>

Commits on Nov 12, 2023

Merge pull request #19 from AhmedEhab2022/teamMember1 ...
Ahmed-Amer01 committed 3 days ago

Verified d517e42 <>

add read Memory.get instruction,convertDecToHex, instruction 2,5
Ahmed-Amer01 committed 3 days ago

db57d22 <>

Commits on Nov 5, 2023

Merge pull request #6 from AhmedEhab2022/hello ...
Ahmed-Amer01 committed last week

Verified 8d5be2f <>

change name
Ahmed-Amer01 committed last week

2ec73e9 <>



AhmedEhab2022 / OOP_Assignment_2

Type to search



<> Code Issues Pull requests 1 Actions Projects Security Insights

Commits

main

Commits on Nov 15, 2023

modifie display status

mohanad-80 committed 15 hours ago



6d47434



modifie last date

mohanad-80 committed 15 hours ago



2308967



Merge branch 'main' of https://github.com/AhmedEhab2022/OOP_Assignment_2

mohanad-80 committed 15 hours ago



1d35cc8



remove fetch

mohanad-80 committed 15 hours ago



c888bb4



Commits on Nov 13, 2023

fix excute

mohanad-80 committed 3 days ago



1a62bbf



Commits on Nov 12, 2023

create seprated files

mohanad-80 committed 3 days ago



f72c2a4



add addFloat

mohanad-80 committed 4 days ago



c6cabf9

