Software Engineering Project

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Product Backlog

Scientific Programmable Calculator

User Stories

Priority Order

The priority order goes from value 1 to 6 where 1 is the highest priority and 6 the lowest.

ID	Description	Priority	Story points

Basic Operations

A1.	As a user I want to add 2 complex numbers in order to calculate their sum	1	1
A2.	As a user I want to subtract 2 complex numbers in order to calculate the difference between them	1	1
A3.	As a user I want to multiply 2 complex numbers in order to calculate the product between them	1	1
A4.	As a user I want to divide 2 complex numbers in order to calculate the quotient between them	1	1
A5.	As a user I want to make the square root of a complex number	1	1
A6.	As a user I want to invert sign of a complex number	1	1
A7.	As a user I want to insert a number without his imaginary part if this one is equal to zero in order to execute operations with real numbers	1	1

Data Access

B1.	As a user I want to save entered numbers to use them in next operations	2	1
B2.	As a user I want to delete all saved numbers because they might be useless	2	1
B3.	As a user I want to delete the last saved number in case I don't need it	2	1
B4.	As a user I want to duplicate the last saved number	2	1
B5.	As a user I want to swap the last two entered numbers to invert their order in the next operation	2	2
B6.	As a user I want to pick the second last element	2	2

Variables

C1.	As a user I want to save values into variables to use them in next operations	3	5
C2.	As a user I want to take values from variables to use them in next operation	3	5
C3.	As a user I want to add the last entered number to the value of a variable	3	5
C4.	As a user I want to subtract the last entered number to the value of a variable	3	5

User-Defined Operations

D1.	As a user I want to define custom formulas to execute a sequence of operations	4	8
D2.	As a user I want to define custom operations from other custom operations	4	13
D3.	As a user I want to modify custom operations in case I was wrong in writing them	4	5
D4.	As a user I want to delete custom operations in case I don't need them anymore	4	3

D5.	As a user I want to save custom operations in a file so I can use them in a different usage session	4	5
D6.	As a user I want to reload custom operations from a file so I can use them in the current usage session	4	5

Save/Restore Variables

E1.	As a user I want to save a backup of all variables not to lose their values	5	5
E2.	As a user I want to restore the previous values of all variables in case the new value is not useful	5	3
E3.	As a user I want to make the backup of all variables several times to temporarily modify a variable without making this modification visible outside	5	5

Secondary Operations

F1.	As a user I want to perform the pow operation on a complex number in order to calculate a power of it	6	2
F2.	As a user I want to perform the mod operation on a complex number in order to calculate its module	6	2
F3.	As a user I want to perform the arg operation on a complex number in order to calculate its phase	6	2
F4.	As a user I want to perform the log operation on a complex number in order to calculate its natural logarithm	6	3
F5.	As a user I want to execute the exp function in order to calculate the exponential of a complex number	6	3
F6.	As a user I want to execute the sin function in order to calculate the sin of a complex number	6	3
F7.	As a user I want to execute the cos function in order to calculate the cos of a complex number	6	3

F8.	As a user I want to execute the tan function in order to calculate the tan of a complex number	6	3
F9.	As a user I want to execute the asin function in order to calculate the arcsin of a complex number	6	3
F10.	As a user I want to execute the acos function in order to calculate the arccos of a complex number	6	3
F11.	As a user I want to execute the atan function in order to calculate the arctan of a complex number	6	3

Graphical User Interface

G1.	As a user I want to interact with the calculator through a graphical interface so I can perform the operations in a more intuitive way	1	3

Acceptance Criteria

Basic Operation

A1. Given I've saved at least 2 complex numbers, when I press the “+” button or digit “sum” in the text area, then I want as result the sum between the last 2 saved numbers

A2. Given I've saved at least 2 complex numbers, when I press the ”-” button or digit “diff” in the text area, then I want as result the difference between the last 2 saved numbers

A3. Given I've saved at least 2 complex numbers, when I press the “x” button or digit “prod” in the text area, then I want as result the product between the last 2 saved numbers

A4. Given I've saved at least 2 complex numbers, when I press the “/” button or digit “div” in the text area, then I want as result the division between the last 2 saved numbers

A5. Given there are some complex numbers saved, when I press the “rad” button or digit “rad” in the text area, then I want as result the square root of the last one saved

A6. GivenGiven there are some complex numbers saved, when I press the “+/-” button or digit “invsign” in the text area, then I want as result the opposite of the last one saved

A7. Given I’m a user who want to use real numbers in operations, when I want to insert numbers that have imaginary part equals to zero, then I can insert only the real part

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Data Access

B1. Given I’ve entered a complex number, when I press the “save” button, then I can memorize the value of this number

B2. Given I’ve saved some numbers, when I press the “clear” button, then I can delete all saved numbers

B3. Given I’ve saved a number, when I press the “del” button, then I can delete just the last number saved

B4. Given I’ve saved a number, when I press the “dup” button, then I can duplicate the last number saved

B5. Given I've saved at least 2 numbers, when I press the "swap" button, then I can invert the order of the last 2 saved numbers

B6 Given I've saved at least 2 numbers, when I press "csl" (copy second last) button, then I can have access to the second last element

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Variables

C1. Given I've saved at least one number, when I digit ">x" in the text area, where x is the name of a variable, then I can save the last saved number in the selected variable

C2. Given I previously saved one number in a variable, when I digit "<x" in the text area, where x is the name of a variable, then I can use the value in the selected variable as operand of the next operation

C3. Given I've saved a number, when I digit "+x" in the text area, where x is the name of a variable, then I can add the last saved number to the variable value

C4. Given I've saved a number, when I digit "+x" in the text area, where x is the name of a variable, then I can subtract the last saved number to the variable value

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User-Defined Operations

D1. Given I need to execute a sequence of operations, when I press the "create custom function" button, then I can define a new custom operation

D2. Given I've already created a custom operation, when I press the "create custom function" button, I can define a new custom operation including the previous one too

D3. Given I've already created a custom operation, when I select it, then I can modify it

D4. Given I've already created a custom operation, when I select it, I can delete it

D5. Given I've already created a series of custom operations, when I press "save custom operation", then all the operations will be saved in a file

D6. Given I've already saved a series of custom operations in a file, when I press the "reload" button, I can reuse the previous operations saved

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Save/Restore Variables

E1. Given I've already assigned a value to at least one variable, when I press the "save var" button, the all the variables will be saved

E2. Given I've already saved the variables, when I press the "restore var" button, I can restore the previous value of the variables

E3. Given I've already done a backup of all variables, when I press the "save var" button then I can make a new backup without deleting the previous one

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Secondary Operations

F1. Given there are some complex numbers saved, when I press the "pow" button or digit "pow" in the text area, then I want as result the power of the last one saved

F2. Given there are some complex numbers saved, when I press the "mod" button or digit "mod" in the text area, then I want as result the module of the last one saved

F3. Given there are some complex numbers saved, when I press the "arg" button or digit "arg" in the text area, then I want as result the phase of the last one saved

F4. Given there are some complex numbers saved, when I press the "log" button or digit "log" in the text area, then I want as result the natural logarithm of the last one saved

F5. Given there are some complex numbers saved, when I press the "exp" button or digit "exp" in the text area, then I want as result the exponential of the last one saved

F6. Given there are some complex numbers saved, when I press the "sin" button or digit "sin" in the text area, then I want as result the sin of the last one saved

F7. Given there are some complex numbers saved, when I press the "cos" button or digit "cos" in the text area, then I want as result the cos of the last one saved

F8. Given there are some complex numbers saved, when I press the “tan” button or digit “tan” in the text area, then I want as result the tan of the last one saved

F9. Given there are some complex numbers saved, when I press the “asin” button or digit “asin” in the text area, then I want as result the arcsin of the last one saved

F10. Given there are some complex numbers saved, when I press the “acos” button or digit “acos” in the text area, then I want as result the arccos of the last one saved

F11. Given there are some complex numbers saved, when I press the “atan” button or digit “atan” in the text area, then I want as result the arctan of the last one saved

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Graphical User Interface

G1. Given I’m a user, when I open the Calculator Software, than I can perform the operations through a graphical interface

Definition of Done

The project will be considered “done” when all the user stories related to Basic Operations, Data Access, Variables and User-Defined Operations will be implemented, according to acceptance criteria and tested successfully, and a documentation explaining s and describing the Software Development Process will be uploaded by the team.
