BDD test cases

```
Feature: add
  I want to use add operator

  Scenario Outline: Addition
    Given I run the code
    When <a> plus <b>
    Then I get the result <result>

    Examples:
      | a   | b   | result |
      | 10  | 20  | 30     |
      | 123 | 456 | 579    |
      | 177 | 13  | 190    |
Feature: minus
  I want to use minus operator

  Scenario Outline: Subtraction
    Given I run the code
    When <a> minus <b>
    Then I get the result <result>

    Examples:
      | a   | b   | result |
      | 10  | 20  | -10    |
      | 222 | 111 | 111    |
      | 100 | -78 | 178    |
Feature: multiply
  I want to use multiply operator

  Scenario Outline: Multiplication
    Given I run the code
```

When <a> multiply <b>

Then I get the result <result> in Long

Examples:

| a | b | result |

| 10 | 20 | 200 |

| 92 | -19 | -1748 |

| 12 | -19 | -228 |

Feature: divide

I want to use divide operator

Scenario Outline: Division

Given I run the code

When <a> divide <b>

Then I get the result <result> in Double with <precision>

Examples:

| a | b | result | precision |

| 10 | 20 | 0.5 | 1 |

| 222 | 111 | 2.0 | 0 |

| 132 | 1 | 132.0 | 0 |

Scenario Outline: Illegal Division

Given I run the code

When <a> illegal divide <b>

Then I get the Exception <result>

Examples:

| a | b | result |

| 10 | 0 | "Divisor cannot be zero" |

Feature: modulus

I want to use modulus operator

```
  Scenario Outline: Modulation
    Given I run the code
    When <a> modulus <b>
    Then I get the result <result> in Double with <precision>

    Examples:
      | a   | b   | result | precision |
      | 10  | 20  |  10.0  | 0         |
      | 222 | 111 |  0.0   | 0         |

  Scenario Outline: Illegal Modulation
    Given I run the code
    When <a> illegal modulus <b>
    Then I get the Exception <result>

    Examples:
      | a   | b   | result                  |
      | 10  | 0   | "Modular cannot be zero" |
Feature: power
  I want to use power operator

  Scenario Outline: Exponentiation
    Given I run the code
    When <a> to the power of <b>
    Then I get the result <result> in Double with <precision>

    Examples:
      | a  | b  | result   | precision |
      | 10 | 5  | 100000.0 | 0         |
      | 8  | 3  | 512.0    | 0         |
```

```
  Scenario Outline: Negative Exponentiation
    Given I run the code
    When <a> to the power of <b>
    Then I get the result <result> in Double with <precision>

    Examples:
      | a   | b    | result     | precision |
      | 10  | -5   | 0.000001   | 5         |
      | 27  | -3   | 0.00000508 | 8         |

  Scenario Outline: Error Exponentiation
    Given I run the code
    When illegal <a> to the power of <b>
    Then I get the Exception <result>

    Examples:
      | a  | b   | result                          |
      | 0  | -10 | "Undefined for 0^(negative number)" |
Feature: gcd
  I want to use GCD operator

  Scenario Outline: GCD
    Given I run the code
    When <a> gcd <b>
    Then I get the result <result>

    Examples:
      | a   | b   | result |
      | 92  | 312  | 4     |
      | 222 | 111 | 111    |

  Scenario Outline: Illegal GCD
```

Given I run the code

When <a> illegal gcd <b>

Then I get the Exception <result>

Examples:

| a | b | result |

| 0 | 0 | "GCD(0, 0) is undefined" |

Feature: fibonacci

I want to use add operator

Scenario Outline: Fibonacci

Given I run the code

When fibonacci number of <a>

Then I get the result <result> in Long

Examples:

| a | result |

| 15 | 610 |

| 1 | 1 |

| 0 | 0 |

| 50 | 12586269025 |

Scenario Outline: Error Fibonacci

Given I run the code

When illegal fibonacci number of <a>

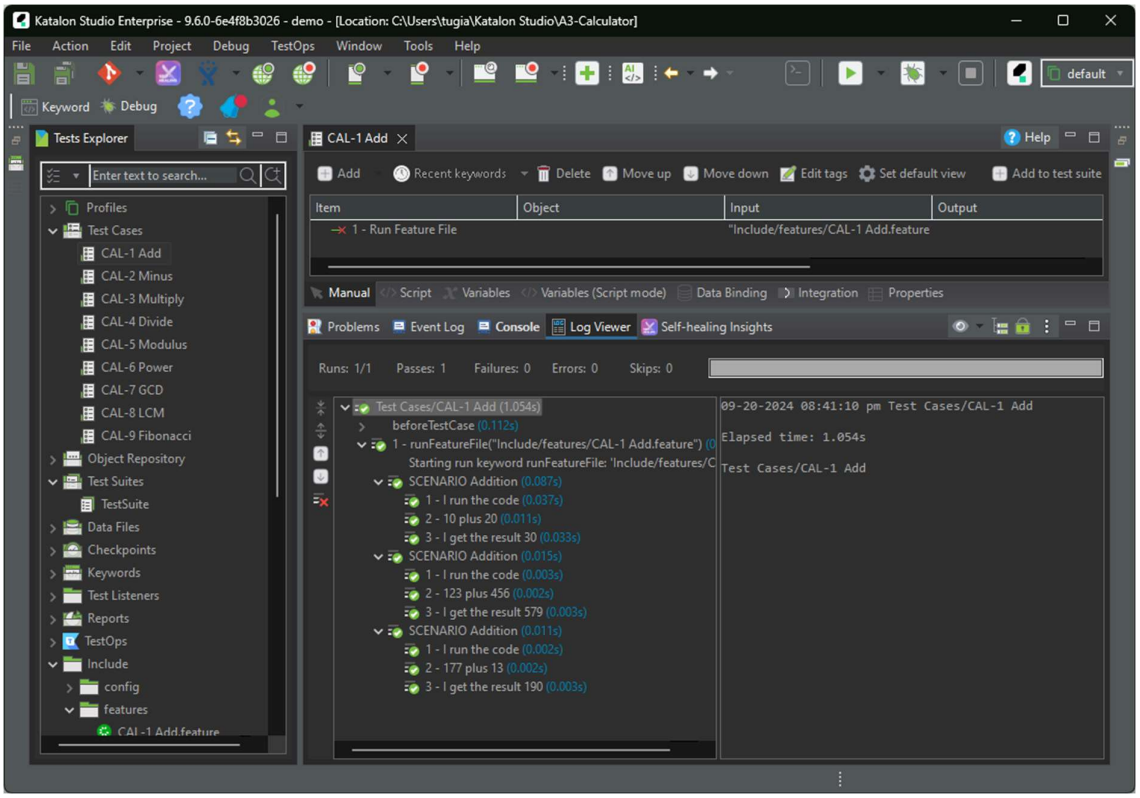
Then I get the Exception <result>

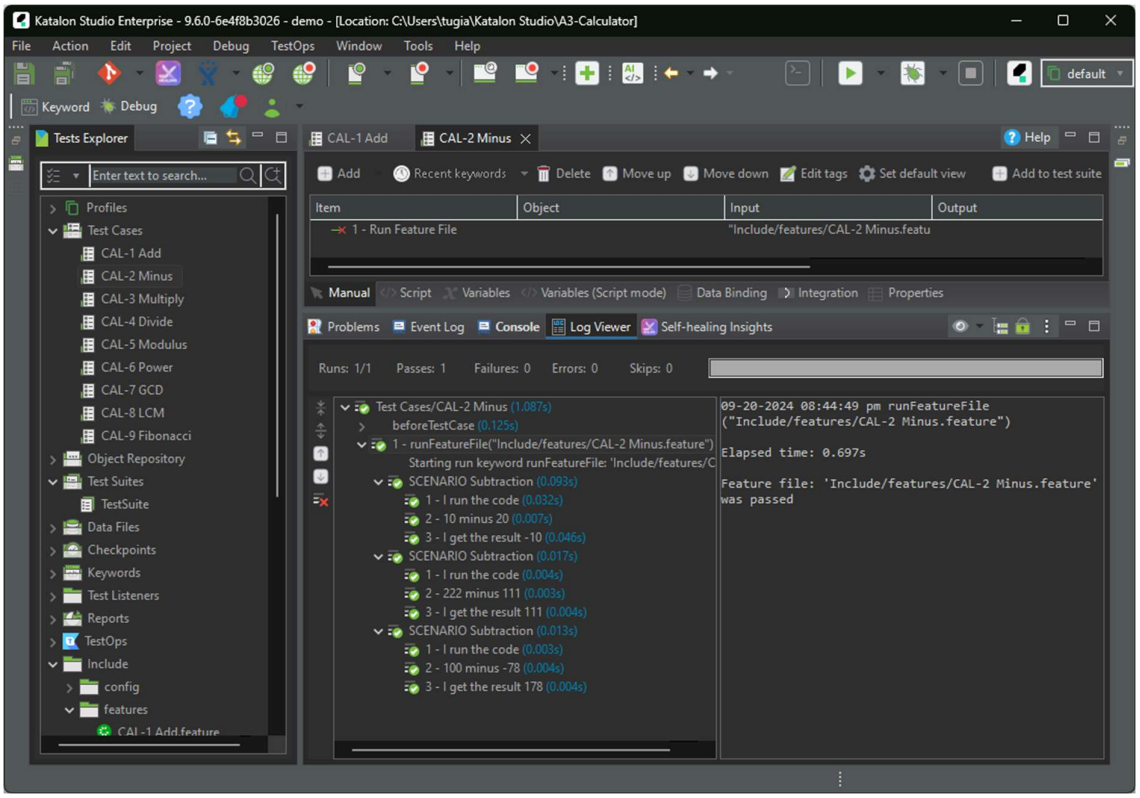
Examples:

| a | result |

| -1 | "Fibonacci cannot be calculated for negative numbers" |

Test outputs


Katalon Studio Enterprise - 9.6.0-6e4f8b3026 - demo - [Location: C:\Users\tugia\Katalon Studio\A3-Calculator]
File Action Edit Project Debug TestOps Window Tools Help
Keyword Debug
default
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-1 Add
Help
Add
Recent keywords
Delete
Move up
Move down
Edit tags
Set default view
Add to test suite
Item
Object
Input
Output
1 - Run Feature File
"Include/features/CAL-1 Add.feature
Manual
Script
Variables
Variables (Script mode)
Data Binding
Integration
Properties
Problems
Event Log
Console
Log Viewer
Self-healing Insights
Runs: 1/1
Passes: 1
Failures: 0
Errors: 0
Skips: 0
Test Cases/CAL-1 Add (1.054s)
beforeTestCase (0.112s)
1 - runFeatureFile("Include/features/CAL-1 Add.feature")
Starting run keyword runFeatureFile: 'Include/features/C
SCENARIO Addition (0.087s)
1 - I run the code (0.037s)
2 - 10 plus 20 (0.011s)
3 - I get the result 30 (0.033s)
SCENARIO Addition (0.015s)
1 - I run the code (0.003s)
2 - 123 plus 456 (0.002s)
3 - I get the result 579 (0.003s)
SCENARIO Addition (0.011s)
1 - I run the code (0.002s)
2 - 177 plus 13 (0.002s)
3 - I get the result 190 (0.003s)
09-20-2024 08:41:10 pm Test Cases/CAL-1 Add
Elapsed time: 1.054s
Test Cases/CAL-1 Add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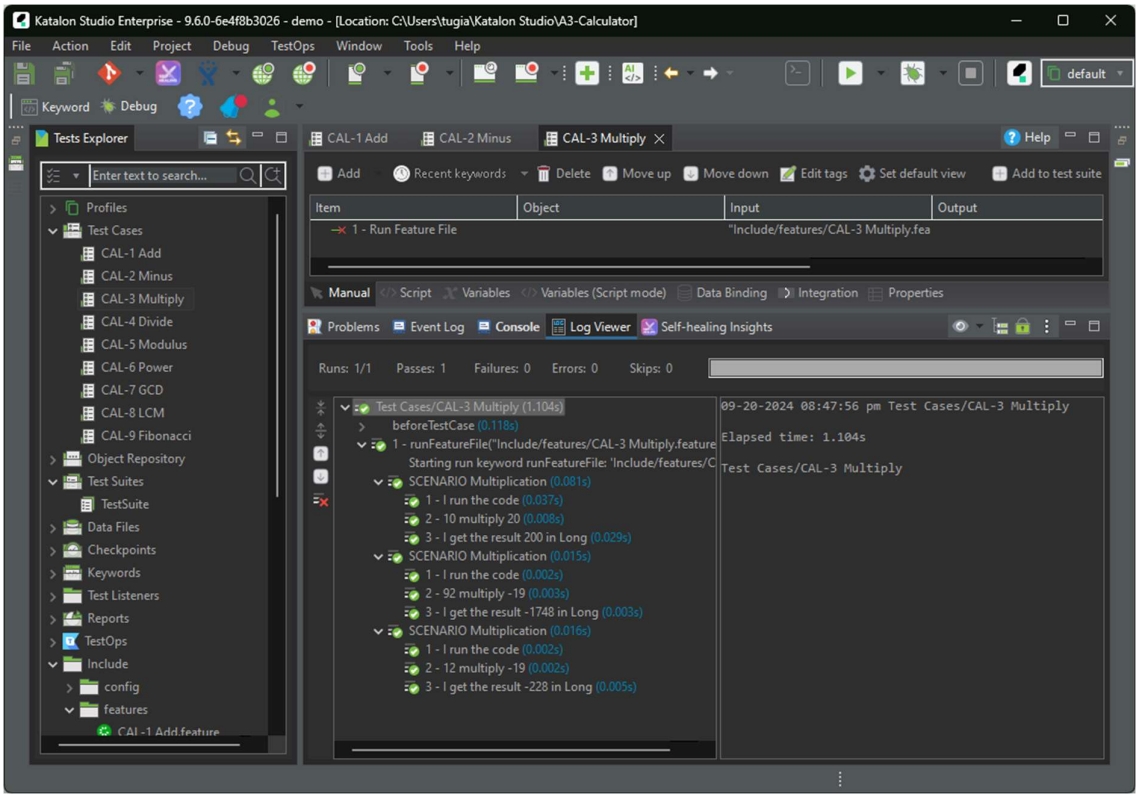
File Action Edit Project Debug TestOps Window Tools Help
Keyword Debug
default
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-1 Add
CAL-2 Minus
Help
Add
Recent keywords
Delete
Move up
Move down
Edit tags
Set default view
Add to test suite
Item
Object
Input
Output
1 - Run Feature File
"Include/features/CAL-2 Minus.featu
Manual
Script
Variables
Variables (Script mode)
Data Binding
Integration
Properties
Problems
Event Log
Console
Log Viewer
Self-healing Insights
Runs: 1/1
Passes: 1
Failures: 0
Errors: 0
Skips: 0
Test Cases/CAL-2 Minus (1.087s)
beforeTestCase (0.125s)
1 - runFeatureFile("Include/features/CAL-2 Minus.feature")
Starting run keyword runFeatureFile: 'Include/features/C
SCENARIO Subtraction (0.093s)
1 - I run the code (0.032s)
2 - 10 minus 20 (0.007s)
3 - I get the result -10 (0.046s)
SCENARIO Subtraction (0.017s)
1 - I run the code (0.004s)
2 - 222 minus 111 (0.003s)
3 - I get the result 111 (0.004s)
SCENARIO Subtraction (0.013s)
1 - I run the code (0.003s)
2 - 100 minus -78 (0.004s)
3 - I get the result 178 (0.004s)
09-20-2024 08:44:49 pm runFeatureFile
("Include/features/CAL-2 Minus.feature")
Elapsed time: 0.697s
Feature file: 'Include/features/CAL-2 Minus.feature'
was passed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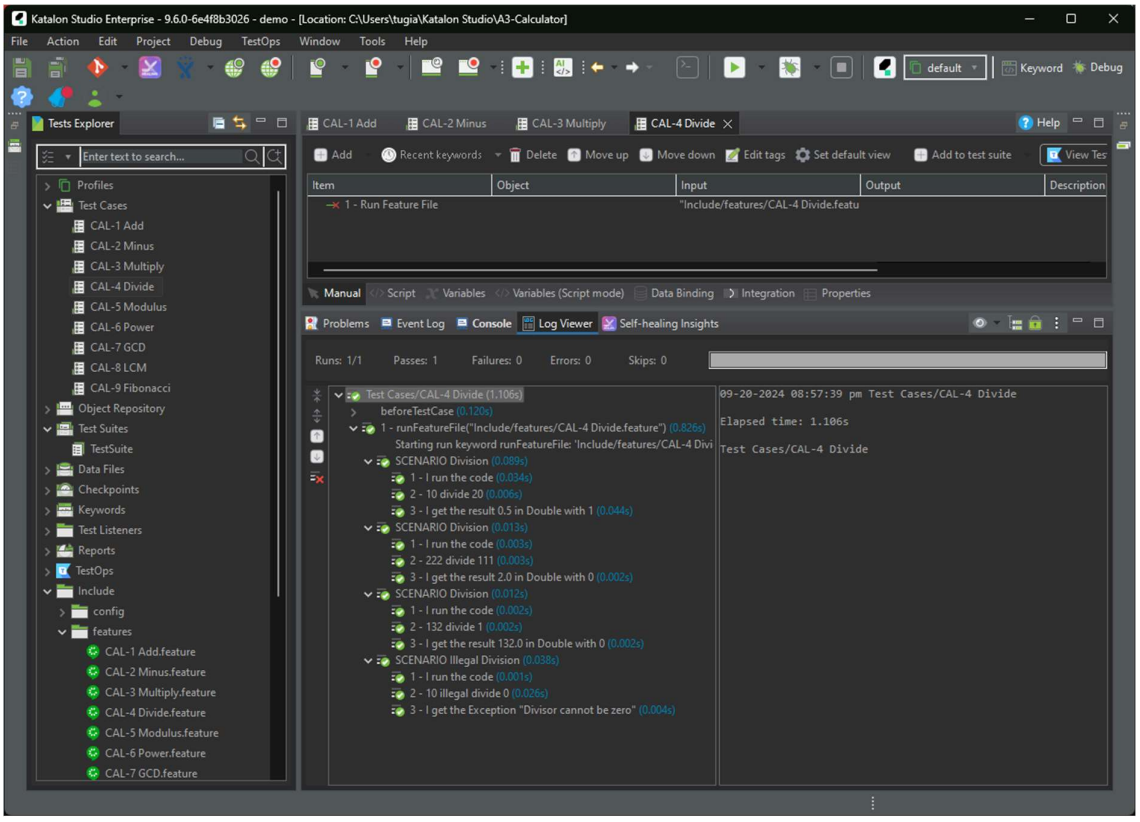
File Action Edit Project Debug TestOps Window Tools Help
Keyword Debug
default
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
Help
Add
Recent keywords
Delete
Move up
Move down
Edit tags
Set default view
Add to test suite
Item
Object
Input
Output
1 - Run Feature File
"Include/features/CAL-3 Multiply.fea
Manual
Script
Variables
Variables (Script mode)
Data Binding
Integration
Properties
Problems
Event Log
Console
Log Viewer
Self-healing Insights
Runs: 1/1
Passes: 1
Failures: 0
Errors: 0
Skips: 0
Test Cases/CAL-3 Multiply (1.104s)
beforeTestCase (0.118s)
1 - runFeatureFile("Include/features/CAL-3 Multiply.feature
Starting run keyword runFeatureFile: 'Include/features/C
SCENARIO Multiplication (0.081s)
1 - I run the code (0.037s)
2 - 10 multiply 20 (0.008s)
3 - I get the result 200 in Long (0.029s)
SCENARIO Multiplication (0.015s)
1 - I run the code (0.002s)
2 - 92 multiply -19 (0.003s)
3 - I get the result -1748 in Long (0.003s)
SCENARIO Multiplication (0.016s)
1 - I run the code (0.002s)
2 - 12 multiply -19 (0.002s)
3 - I get the result -228 in Long (0.005s)
09-20-2024 08:47:56 pm Test Cases/CAL-3 Multiply
Elapsed time: 1.104s
Test Cases/CAL-3 Multiply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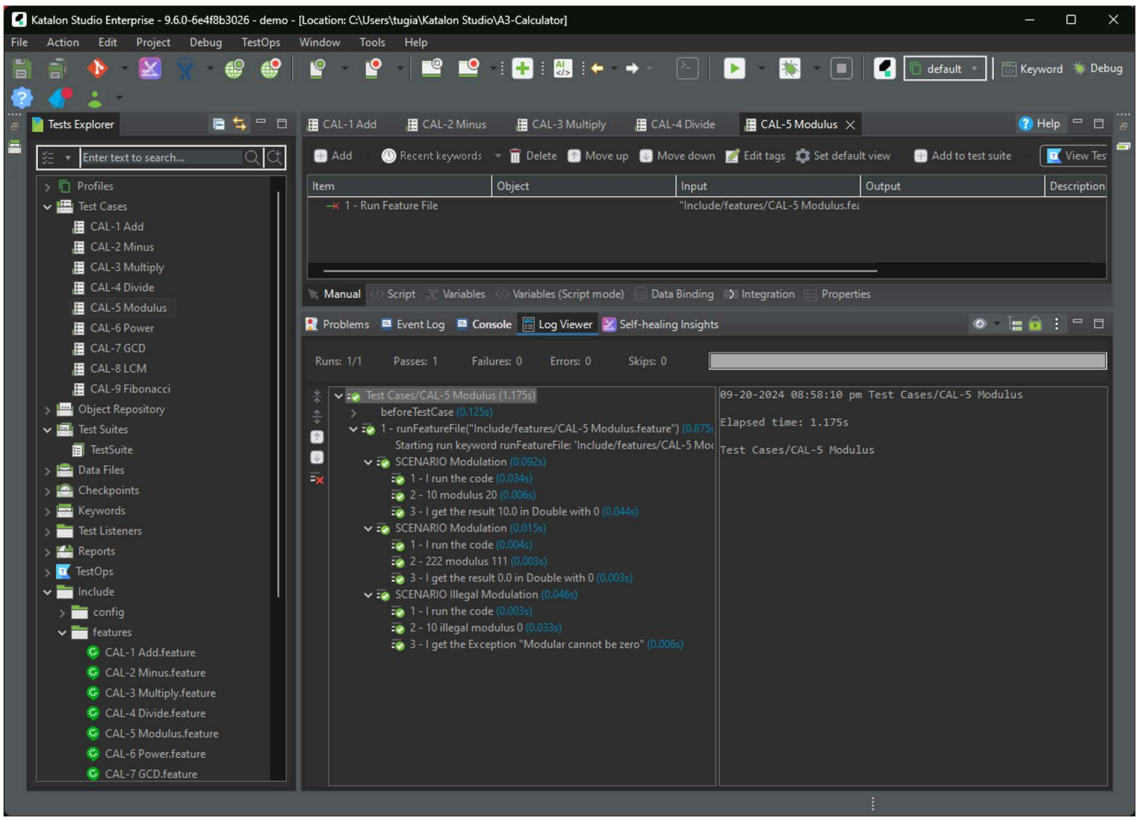
File Action Edit Project Debug TestOps Window Tools Help
default
Keyword
Debug
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-2 Minus.feature
CAL-3 Multiply.feature
CAL-4 Divide.feature
CAL-5 Modulus.feature
CAL-6 Power.feature
CAL-7 GCD.feature
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
Help
Add
Recent keywords
Delete
Move up
Move down
Edit tags
Set default view
Add to test suite
View Tes
Item
Object
Input
Output
Description
1 - Run Feature File
"Include/features/CAL-4 Divide.featu
Manual
Script
Variables
Variables (Script mode)
Data Binding
Integration
Properties
Problems
Event Log
Console
Log Viewer
Self-healing Insights
Runs: 1/1
Passes: 1
Failures: 0
Errors: 0
Skips: 0
Test Cases/CAL-4 Divide (1.106s)
beforeTestCase (0.120s)
1 - runFeatureFile("Include/features/CAL-4 Divide.feature") (0.826s)
Starting run keyword runFeatureFile: 'Include/features/CAL-4 Divi
SCENARIO Division (0.089s)
1 - I run the code (0.034s)
2 - 10 divide 20 (0.006s)
3 - I get the result 0.5 in Double with 1 (0.044s)
SCENARIO Division (0.013s)
1 - I run the code (0.003s)
2 - 222 divide 111 (0.003s)
3 - I get the result 2.0 in Double with 0 (0.002s)
SCENARIO Division (0.012s)
1 - I run the code (0.002s)
2 - 132 divide 1 (0.002s)
3 - I get the result 132.0 in Double with 0 (0.002s)
SCENARIO Illegal Division (0.038s)
1 - I run the code (0.001s)
2 - 10 illegal divide 0 (0.026s)
3 - I get the Exception "Divisor cannot be zero" (0.004s)
09-20-2024 08:57:39 pm Test Cases/CAL-4 Divide
Elapsed time: 1.106s
Test Cases/CAL-4 Divide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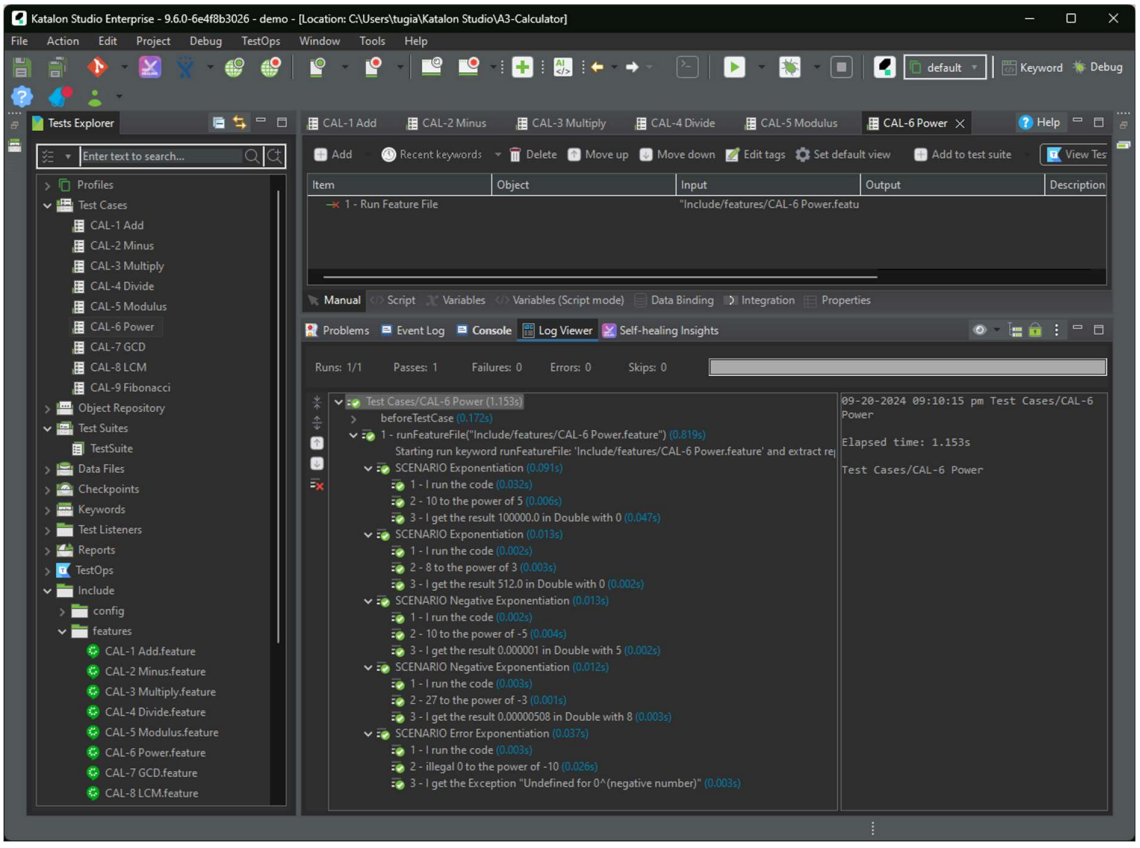
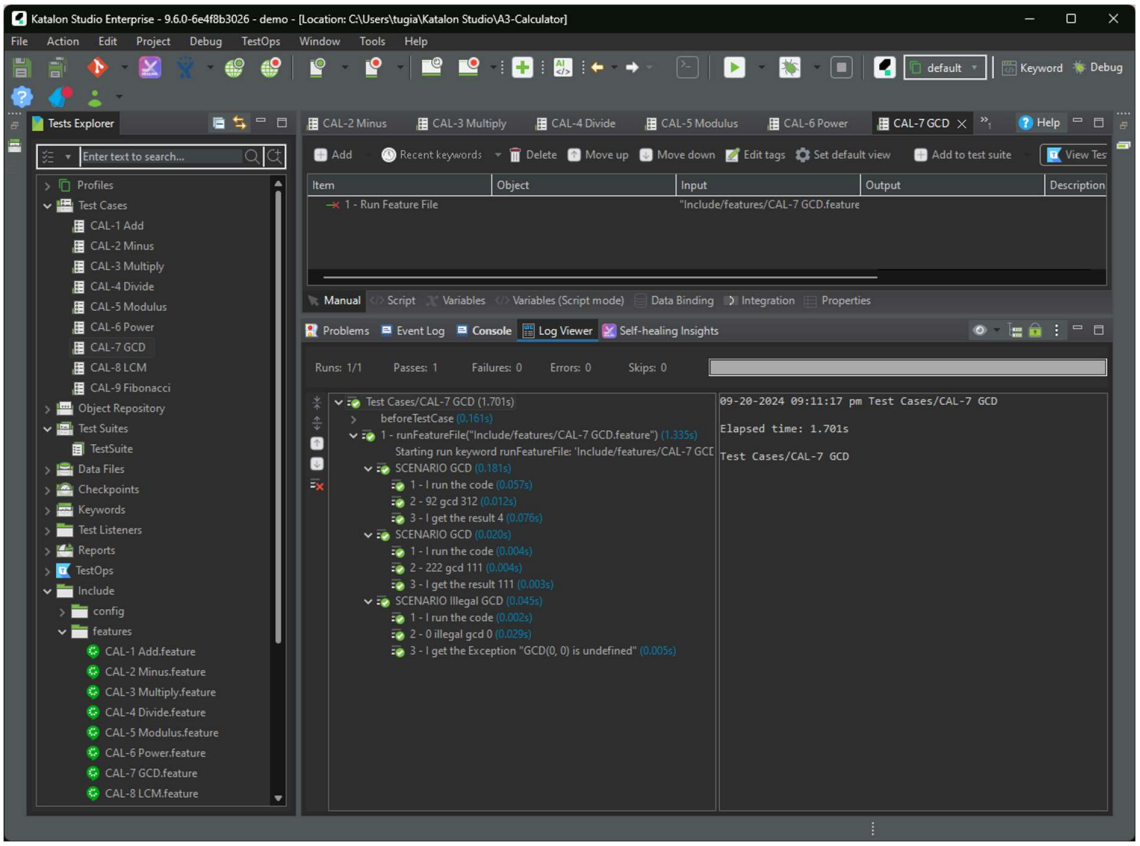
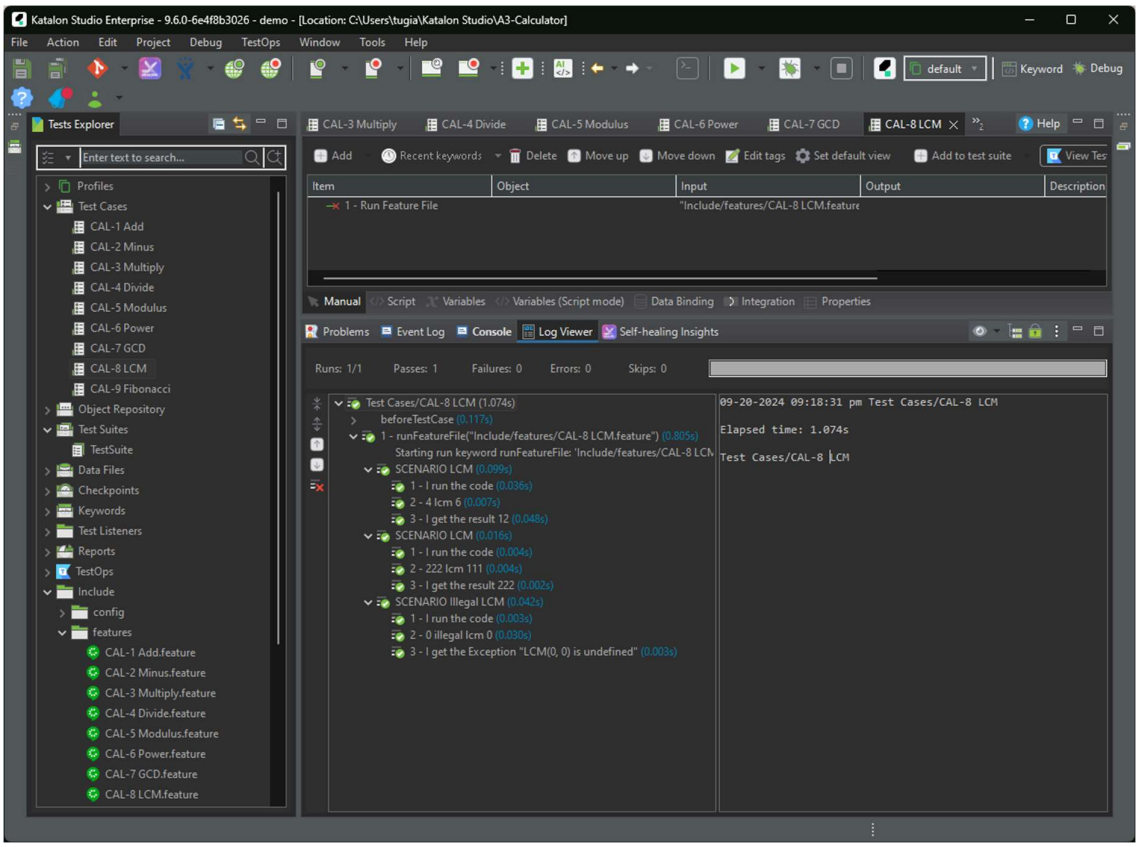
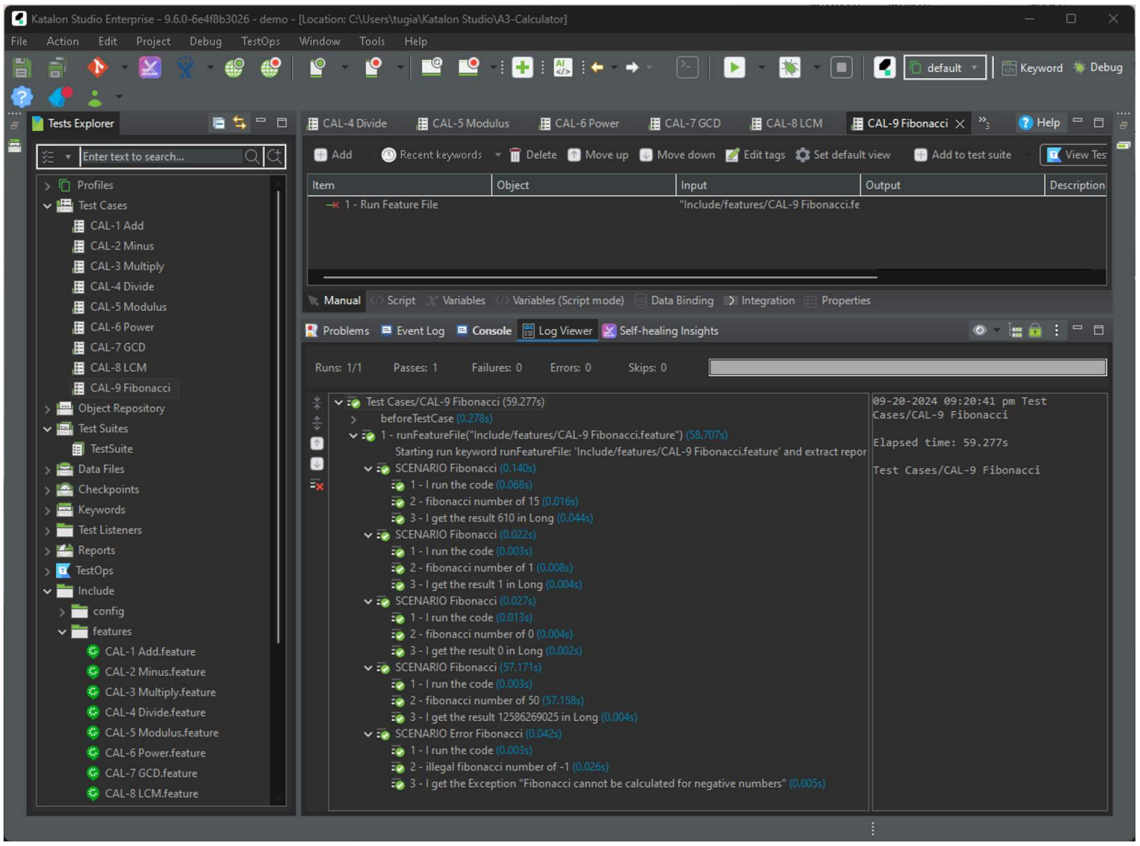
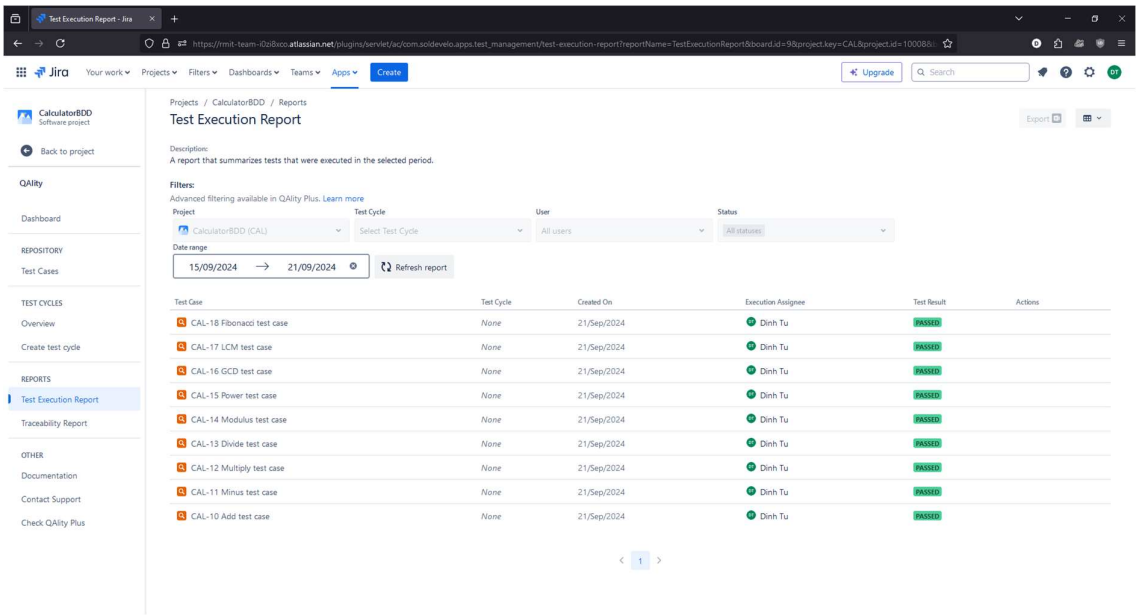
File Action Edit Project Debug TestOps Window Tools Help
default Keyword Debug
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-2 Minus.feature
CAL-3 Multiply.feature
CAL-4 Divide.feature
CAL-5 Modulus.feature
CAL-6 Power.feature
CAL-7 GCD.feature
CAL-1 Add CAL-2 Minus CAL-3 Multiply CAL-4 Divide CAL-5 Modulus
Help
Add Recent keywords Delete Move up Move down Edit tags Set default view Add to test suite View Tes
Item Object Input Output Description
1 - Run Feature File "Include/features/CAL-5 Modulus.fea
Manual Script Variables Variables (Script mode) Data Binding Integration Properties
Problems Event Log Console Log Viewer Self-healing Insights
Runs: 1/1 Passes: 1 Failures: 0 Errors: 0 Skips: 0
Test Cases/CAL-5 Modulus (1.175s)
beforeTestCase (0.125s)
1 - runFeatureFile("Include/features/CAL-5 Modulus.feature") (0.875s)
Starting run keyword runFeatureFile: 'Include/features/CAL-5 Mo
SCENARIO Modulation (0.092s)
1 - I run the code (0.034s)
2 - 10 modulus 20 (0.006s)
3 - I get the result 10.0 in Double with 0 (0.044s)
SCENARIO Modulation (0.015s)
1 - I run the code (0.004s)
2 - 222 modulus 111 (0.003s)
3 - I get the result 0.0 in Double with 0 (0.003s)
SCENARIO Illegal Modulation (0.046s)
1 - I run the code (0.003s)
2 - 10 illegal modulus 0 (0.033s)
3 - I get the Exception "Modular cannot be zero" (0.006s)
09-20-2024 08:58:10 pm Test Cases/CAL-5 Modulus
Elapsed time: 1.175s
Test Cases/CAL-5 Modulus


Katalon Studio Enterprise - 9.6.0-6e4f8b3026 - demo - [Location: C:\Users\tugia\Katalon Studio\A3-Calculator]
File Action Edit Project Debug TestOps Window Tools Help
default Keyword Debug
Tests Explorer
Enter text to search...
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-2 Minus.feature
CAL-3 Multiply.feature
CAL-4 Divide.feature
CAL-5 Modulus.feature
CAL-6 Power.feature
CAL-7 GCD.feature
CAL-8 LCM.feature
CAL-1 Add CAL-2 Minus CAL-3 Multiply CAL-4 Divide CAL-5 Modulus CAL-6 Power
Help
Add Recent keywords Delete Move up Move down Edit tags Set default view Add to test suite View Tes
Item Object Input Output Description
1 - Run Feature File "Include/features/CAL-6 Power.featu
Manual Script Variables Variables (Script mode) Data Binding Integration Properties
Problems Event Log Console Log Viewer Self-healing Insights
Runs: 1/1 Passes: 1 Failures: 0 Errors: 0 Skips: 0
Test Cases/CAL-6 Power (1.153s)
beforeTestCase (0.172s)
1 - runFeatureFile("Include/features/CAL-6 Power.feature") (0.819s)
Starting run keyword runFeatureFile: 'Include/features/CAL-6 Power.feature' and extract re
SCENARIO Exponentiation (0.091s)
1 - I run the code (0.032s)
2 - 10 to the power of 5 (0.006s)
3 - I get the result 100000.0 in Double with 0 (0.047s)
SCENARIO Exponentiation (0.013s)
1 - I run the code (0.002s)
2 - 8 to the power of 3 (0.003s)
3 - I get the result 512.0 in Double with 0 (0.002s)
SCENARIO Negative Exponentiation (0.013s)
1 - I run the code (0.002s)
2 - 10 to the power of -5 (0.004s)
3 - I get the result 0.000001 in Double with 5 (0.002s)
SCENARIO Negative Exponentiation (0.012s)
1 - I run the code (0.003s)
2 - 27 to the power of -3 (0.001s)
3 - I get the result 0.00000508 in Double with 8 (0.003s)
SCENARIO Error Exponentiation (0.037s)
1 - I run the code (0.003s)
2 - illegal 0 to the power of -10 (0.026s)
3 - I get the Exception "Undefined for 0^(negative number)" (0.003s)
09-20-2024 09:10:15 pm Test Cases/CAL-6 Power
Elapsed time: 1.153s
Test Cases/CAL-6 Power


Katalon Studio Enterprise - 9.6.0-6e4f8b3026 - demo - [Location: C:\Users\tugia\Katalon Studio\A3-Calculator]
File Action Edit Project Debug TestOps Window Tools Help
Tests Explorer
CAL-2 Minus CAL-3 Multiply CAL-4 Divide CAL-5 Modulus CAL-6 Power CAL-7 GCD
Add Recent keywords Delete Move up Move down Edit tags Set default view Add to test suite
Item Object Input Output Description
1 - Run Feature File "Include/features/CAL-7 GCD.feature
Manual Script Variables Variables (Script mode) Data Binding Integration Properties
Problems Event Log Console Log Viewer Self-healing Insights
Runs: 1/1 Passes: 1 Failures: 0 Errors: 0 Skips: 0
Test Cases/CAL-7 GCD (1.701s)
beforeTestCase (0.161s)
1 - runFeatureFile("Include/features/CAL-7 GCD.feature") (1.335s)
SCENARIO GCD (0.181s)
1 - I run the code (0.057s)
2 - 92 gcd 312 (0.012s)
3 - I get the result 4 (0.076s)
SCENARIO GCD (0.020s)
1 - I run the code (0.004s)
2 - 222 gcd 111 (0.004s)
3 - I get the result 111 (0.003s)
SCENARIO Illegal GCD (0.045s)
1 - I run the code (0.002s)
2 - 0 illegal gcd 0 (0.029s)
3 - I get the Exception "GCD(0, 0) is undefined" (0.005s)
09-20-2024 09:11:17 pm Test Cases/CAL-7 GCD
Elapsed time: 1.701s
Test Cases/CAL-7 GCD
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-2 Minus.feature
CAL-3 Multiply.feature
CAL-4 Divide.feature
CAL-5 Modulus.feature
CAL-6 Power.feature
CAL-7 GCD.feature
CAL-8 LCM.feature


Katalon Studio Enterprise - 9.6.0-6e4f8b3026 - demo - [Location: C:\Users\tugia\Katalon Studio\A3-Calculator]
File Action Edit Project Debug TestOps Window Tools Help
Tests Explorer
CAL-3 Multiply CAL-4 Divide CAL-5 Modulus CAL-6 Power CAL-7 GCD CAL-8 LCM
Add Recent keywords Delete Move up Move down Edit tags Set default view Add to test suite
Item Object Input Output Description
1 - Run Feature File "Include/features/CAL-8 LCM.feature
Manual Script Variables Variables (Script mode) Data Binding Integration Properties
Problems Event Log Console Log Viewer Self-healing Insights
Runs: 1/1 Passes: 1 Failures: 0 Errors: 0 Skips: 0
Test Cases/CAL-8 LCM (1.074s)
beforeTestCase (0.117s)
1 - runFeatureFile("Include/features/CAL-8 LCM.feature") (0.805s)
SCENARIO LCM (0.099s)
1 - I run the code (0.036s)
2 - 4 lcm 6 (0.007s)
3 - I get the result 12 (0.048s)
SCENARIO LCM (0.016s)
1 - I run the code (0.004s)
2 - 222 lcm 111 (0.004s)
3 - I get the result 222 (0.002s)
SCENARIO Illegal LCM (0.042s)
1 - I run the code (0.003s)
2 - 0 illegal lcm 0 (0.030s)
3 - I get the Exception "LCM(0, 0) is undefined" (0.003s)
09-20-2024 09:18:31 pm Test Cases/CAL-8 LCM
Elapsed time: 1.074s
Test Cases/CAL-8 LCM
Profiles
Test Cases
CAL-1 Add
CAL-2 Minus
CAL-3 Multiply
CAL-4 Divide
CAL-5 Modulus
CAL-6 Power
CAL-7 GCD
CAL-8 LCM
CAL-9 Fibonacci
Object Repository
Test Suites
TestSuite
Data Files
Checkpoints
Keywords
Test Listeners
Reports
TestOps
Include
config
features
CAL-1 Add.feature
CAL-2 Minus.feature
CAL-3 Multiply.feature
CAL-4 Divide.feature
CAL-5 Modulus.feature
CAL-6 Power.feature
CAL-7 GCD.feature
CAL-8 LCM.feature





Defect:

Defect 1: Can not get the right input for controlling the Calculator

- Reason: Due to the intended behaviour of the nextInt() function, the remain character left in the buffer will be"\n". So, when the next scanner readding will get that "\n".

- Fix: Simply put a nextLine() function after the nextInt() so it will get the leftover "\n".

Defect 2: Modulus of zero

- Reason: Modulus cannot be computed with zero as modulator.
- Fix: Using if to check for modulator and throw exception if it is zero.

Defect 3: GCD and LCM function will return negative number

- Reason: 2 input number is not its absolute value hence the result may be negative.
- Fix: Convert both input numbers to its absolute value.

Defect 4: Power function will not accept negative exponential.

- Reason: As I use for loop to calculate the result, the negative exponential will make the loop skipped.
- Fix: Check for negative exponential and latter revert the value if exponential is negative.