Floor11 Calculator

Generated by Doxygen 1.8.17

1 IVS Calculator

1.1 Introduction

This is a documentation for Floor11 Calculator software created for IVS course, by xtalaj00 and xkovac57.

The software is a simple calculator capable of calculating basic arithmetic operations such as addition and subtraction, multiplication and division, exponents and roots or factorial. It's also capable to calculate with parentheses, has a simple memory and it can generate random numbers. It can also switch beween dark and light modes to ease the strain on your eyes!

2 Namespace Index

2.1 Packages

Here are the packages with brief descriptions (if available):

3 Hierarchical Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

4 Class Index

4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

5 File Index

5.1 File List

Here is a list of all files with brief descriptions:

6 Namespace Documentation

6.1 calc_gui Namespace Reference

Classes

- class Ui_MainWindow

  Class responsible for the proper look of GUI of the calculator.

6.2 calc_main Namespace Reference

Classes

- class calcLogic

  Class responsible for the logical aspect of the calculator.

Variables

- app = QtWidgets.QApplication(sys.argv)
- MainWindow = QtWidgets.QMainWindow()
- ui = calcLogic()

6.2.1 Variable Documentation

6.2.1.1 app `calc_main.app = QtWidgets.QApplication(sys.argv)`

6.2.1.2 MainWindow `calc_main.MainWindow = QtWidgets.QMainWindow()`

6.2.1.3 ui `calc_main.ui = calcLogic()`

6.3 mathlib Namespace Reference

Functions

- def add (a, b)

  Sum of 2 numbers.
- def sub (a, b)

  Subtraction of 2 numbers.
- def mul (a, b)

  Product of 2 numbers.
- def div (a, b)

  Division of 2 numbers.
- def fact (n)

  Factorial of a whole number.
- def exp (b, n)

  Exponentiation of a base `b` by an exponent `n`.
- def root (n, x)

  Finding `n` th root of number `x`.
- def rng (x)

  Producing a random number in a given range.

6.3.1 Function Documentation

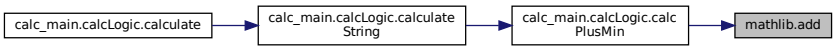
6.3.1.1 add() `def mathlib.add ( a, b )`

Sum of 2 numbers.

Returns

a + b

Here is the caller graph for this function:



6.3.1.2 div() `def mathlib.div ( a, b )`

Division of 2 numbers.

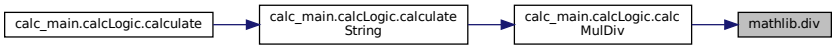
Exceptions

ZeroDivisionError	if `b` is equal to 0

Returns

a / b

Here is the caller graph for this function:



6.3.1.3 exp() `def mathlib.exp ( b, n )`

Exponentiation of a base `b` by an exponent `n`.

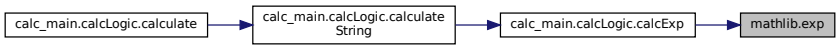
Exceptions

ValueError	if `n` is negative
TypeError	if `n` is a fraction

Returns

b^n

Here is the caller graph for this function:



6.3.1.4 fact() `def mathlib.fact ( n )`

Factorial of a whole number.

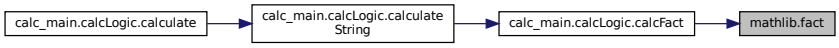
Exceptions

ValueError	if `n` is negative
TypeError	if `n` is a fraction

Returns

n!

Here is the caller graph for this function:



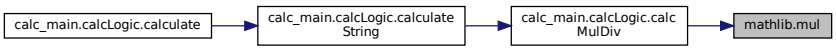
6.3.1.5 mul() `def mathlib.mul ( a, b )`

Product of 2 numbers.

Returns

a ∗ b

Here is the caller graph for this function:



6.3.1.6 rng() `def mathlib.rng ( x )`

Producing a random number in a given range.

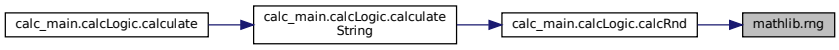
Exceptions

ValueError	if x == 0
TypeError	if x is a fraction

Returns

Random number from range <0,x>

Here is the caller graph for this function:



6.3.1.7 root()

```
def mathlib.root (
    n,
    x )
```

Finding n th root of number x.

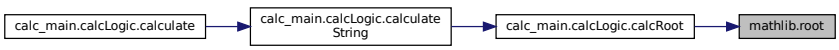
Exceptions

ZeroDivisionError	if n is zero
ValueError	if n is negative
TypeError	if n is a fraction
ValueError	if n is even and x is negative

Returns

x^(1/n)

Here is the caller graph for this function:



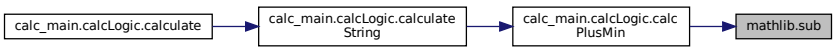
6.3.1.8 sub() def mathlib.sub (*a*, *b*)

Subtraction of 2 numbers.

Returns

a - b

Here is the caller graph for this function:

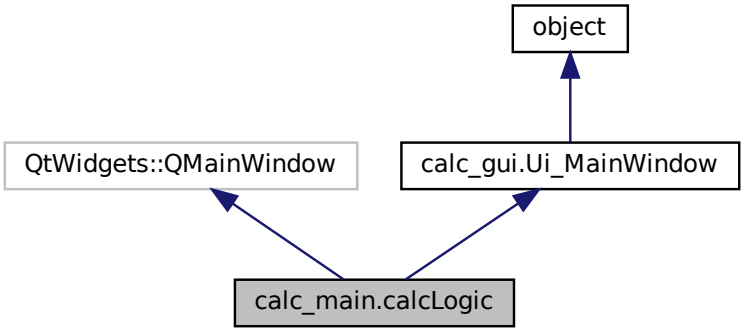


7 Class Documentation

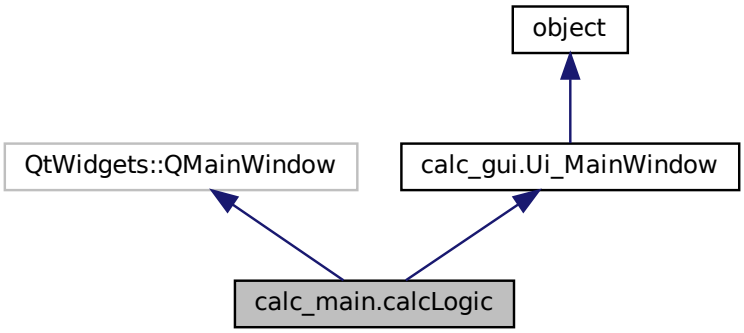
7.1 calc_main.calcLogic Class Reference

Class responsible for the logical aspect of the calculator.

Inheritance diagram for calc_main.calcLogic:



Collaboration diagram for calc_main.calcLogic:



Public Member Functions

- def __init__ (self)

  Default python initialization class used to initialize the variables to a starting state.
- def aNum (self, n)

  Appends a number.
- def aBinOp (self, op)

  Appends or replaces a binary operator.
- def aUnOp (self, op)

  Appends a unary operator.
- def aDecPoint (self)

  Appends a decimal point.
- def backSpace (self)

  Deletes last input.
- def aParenthesis (self, symb)

  Sppends parentheses.
- def clearEverything (self)

  Clears both main and secondary displays.
- def changeSign (self)

  Changes the sign of an integer or float displayed.
- def oPDF_g (self)

  Opens Guide PDF on a specific system (Windows/Linux)
- def memSet (self)

  Stores text displayed on main display to memory.
- def memLoad (self)

  Loads text from memory to main display (if not empty)
- def memClear (self)

  Clears the memory.
- def calculate (self)

  Calculates the result of equation.
- def repairInput (self)

  Repairs any syntax errors still present in the input string.

- def findAllPositions (self, pattern, str)

  Finds all positions of given patterns in string and returns them in a list.
- def findParPairs (self, text)

  Finds corresponding pairs of parentheses.
- def calculateString (self, text)

  Carries out a calculation on a string.
- def calcRnd (self, text)

  Finds all rnd() and assigns random numbers for each one in a given text (if there are any)
- def calcFact (self, text)

  Finds and calculates factorials in a given text (if there are any)
- def calcRoot (self, text)

  Finds and calculates roots in a given text (if there are any)
- def calcExp (self, text)

  Finds and calculates exponents in a given text (if there are any)
- def calcMulDiv (self, text)

  Finds and calculates multiplications and divisions in a given text (if there are any)
- def calcPlusMin (self, text)

  Finds and calculates additions and subtractions in a given text (if there are any)
- def getLeftOperand (self, text, pos)

  Finds the left operand of an operation which is on a given position in a given text.
- def getRightOperand (self, text, pos)

  Finds the right operand of an operation which is on a given position in a given text.
- def errorHandler (self, err_msg)

  Handles error printing onto the main display and further setting of tags.
- def repairOutput (self)

  Repairs the format of the output.
- def sColor (self, dark)

  Function for UI color change (dark/white)

Public Attributes

- md_text

  Text displayed on the main display.
- sd_text

  Text displayed on the secondary (upper) display.
- bin_ops

  List of basic binary operands ('+','-','/','','^')*
- un_ops

  List of "unary" operands (root,'!') (although root is more of a binary operand it behaves more like factorial)
- parentheses

  List of parenthesis characters ('(',')')
- open_par

  Number of open parentheses.
- dec_p

  Bool that keeps track of whether a decimal point can be placed.
- memory

  Variable stores a string that can later be loaded to the main display.
- error

  Bool that keeps track of whether an error has occured.
- result

  Bool that informs us about whether a result from previous calculation is currently being shown.

7.1.1 Detailed Description

Class responsible for the logical aspect of the calculator.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 __init__() def calc_main.calcLogic.__init__ (self)

Default python initialization class used to initialize the variables to a starting state.

7.1.3 Member Function Documentation

7.1.3.1 aBinOp() def calc_main.calcLogic.aBinOp (self, op)

Appends or replaces a binary operator.

Parameters

op	Operator that's being appended

7.1.3.2 aDecPoint() def calc_main.calcLogic.aDecPoint (self)

Appends a decimal point.

7.1.3.3 aNum() def calc_main.calcLogic.aNum (self, n)

Appends a number.

Parameters

n	Number that's being appended

7.1.3.4 aParenthesis() def calc_main.calcLogic.aParenthesis (self, symb)

Sppends parentheses.

Parameters

symb	Symbol that's being appended

7.1.3.5 aUnOp() def calc_main.calcLogic.aUnOp (self, op)

Appends a unary operator.

Parameters

op	Operator that's being appended

7.1.3.6 backSpace() def calc_main.calcLogic.backSpace (self)

Deletes last input.

7.1.3.7 calcExp() def calc_main.calcLogic.calcExp (self, text)

Finds and calculates exponents in a given text (if there are any)

Parameters

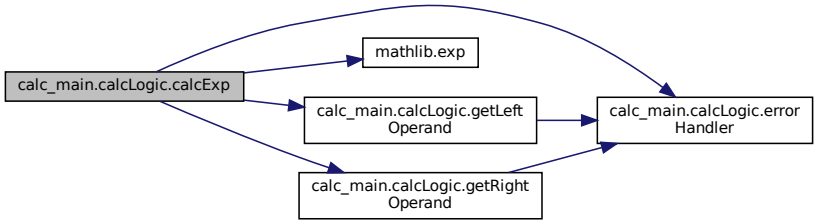
text	Text in which we calculate instances of '^'

Returns

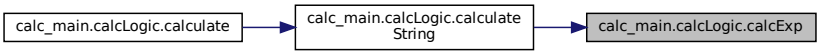
`text` with all exponents calculated

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.8 calcFact() `def calc_main.calcLogic.calcFact ( self, text )`

Finds and calculates factorials in a given text (if there are any)

Parameters

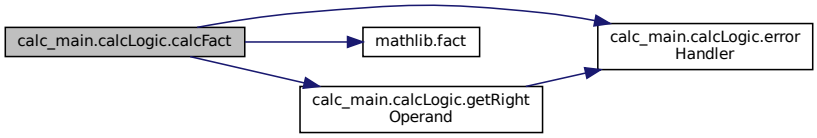
text	Text in which we calculate instances of factorial

Returns

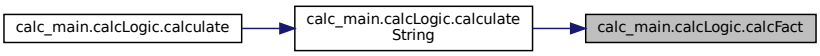
`text` with all factorials calculated

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.9 calcMulDiv() `def calc_main.calcLogic.calcMulDiv (`

self,
text)

Finds and calculates multiplications and divisions in a given text (if there are any)

Parameters

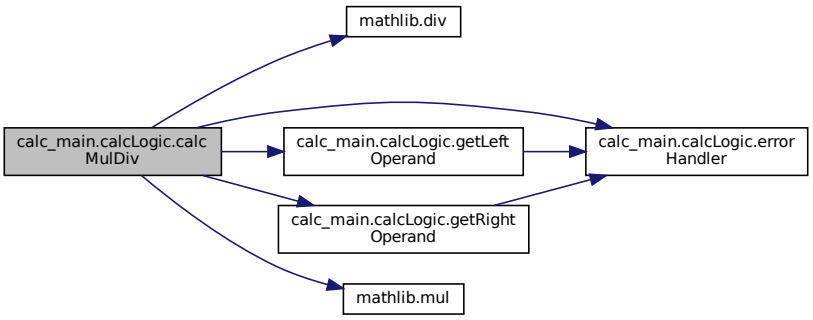
text	Text in which we calculate instances of '∗' and '/'

Returns

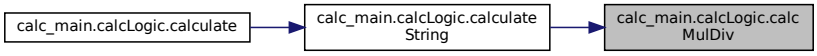
`text` with all multiplications and divisions calculated

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.10 calcPlusMin() `def calc_main.calcLogic.calcPlusMin (`

```
self,
text )
```

Finds and calculates additions and subtractions in a given text (if there are any)

Parameters

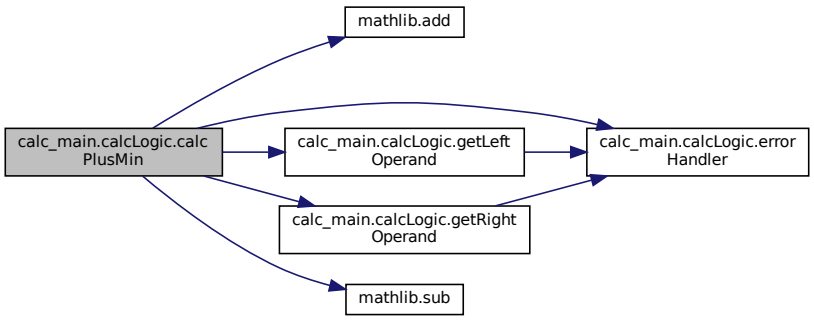
text	Text in which we calculate instances of '+' and '-'

Returns

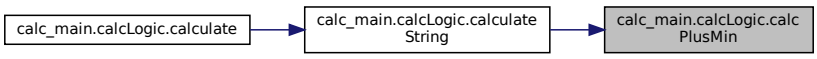
`text` with all additions and subtractions calculated

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.11 calcRnd() `def calc_main.calcLogic.calcRnd (`

```
self,
text )
```

Finds all rnd() and assigns random numbers for each one in a given text (if there are any)

Parameters

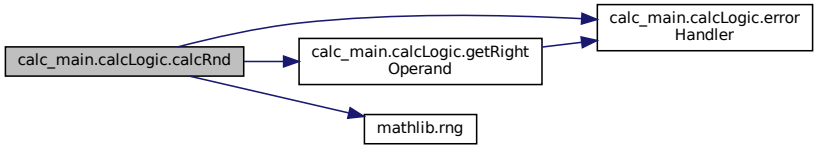
text	Text in which we generate random numbers if instances of rnd() are present

Returns

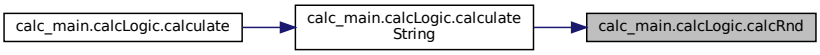
`text` with all random numbers assigned

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.12 calcRoot() `def calc_main.calcLogic.calcRoot ( self, text )`

Finds and calculates roots in a given text (if there are any)

Parameters

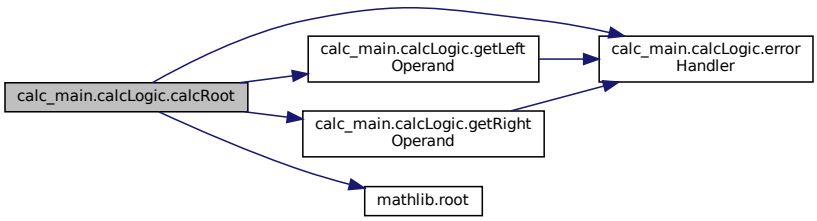
text	Text in which we calculate instances of root

Returns

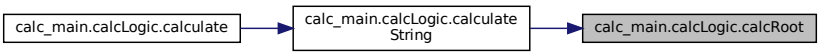
`text` with all roots calculated

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



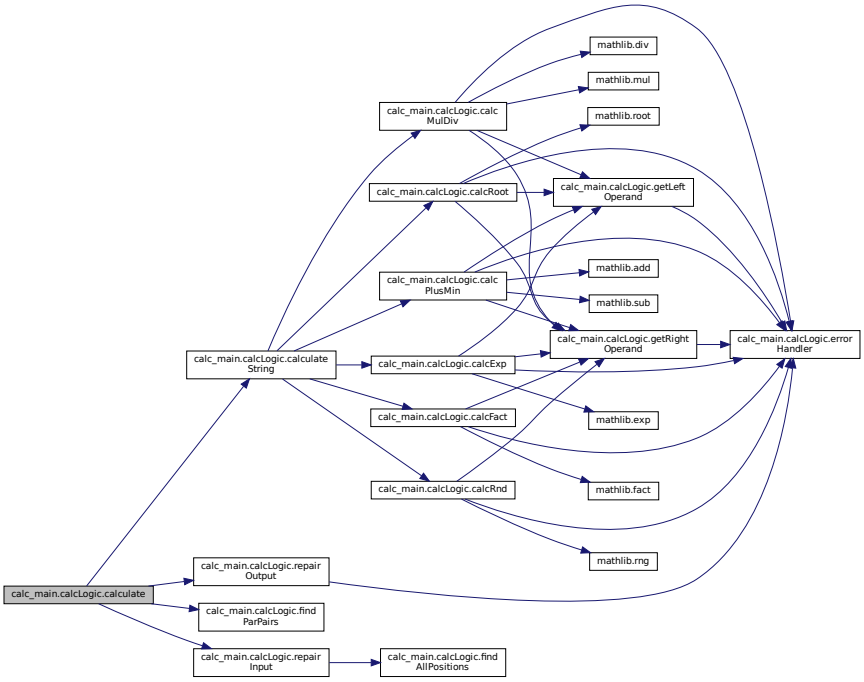
7.1.3.13 calculate() `def calc_main.calcLogic.calculate ( self )`

Calculates the result of equation.

Returns

None if an error occured

Here is the call graph for this function:



7.1.3.14 calculateString() `def calc_main.calcLogic.calculateString (`

self,
text)

Carries out a calculation on a string.

Parameters

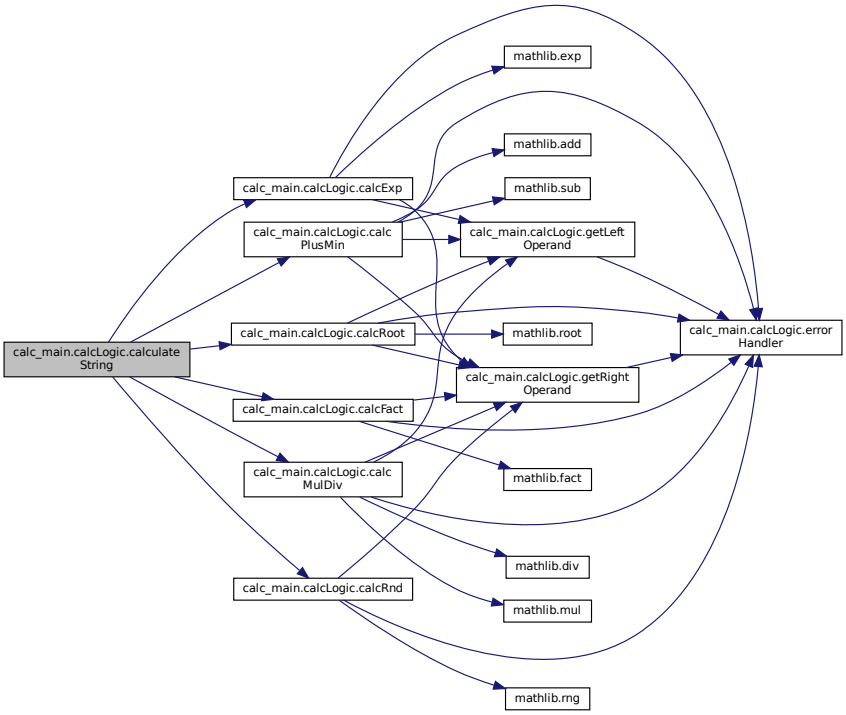
text	Text that's altered step by step by calculations of different operands

Returns

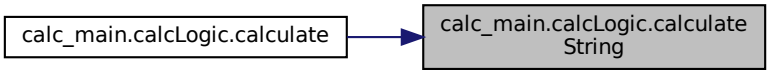
`text` after all the necessary calculations

None if any of the called functions raise the error flag

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.15 changeSign() `def calc_main.calcLogic.changeSign ( self )`

Changes the sign of an integer or float displayed.

7.1.3.16 clearEverything() def calc_main.calcLogic.clearEverything (self)

Clears both main and secondary displays.

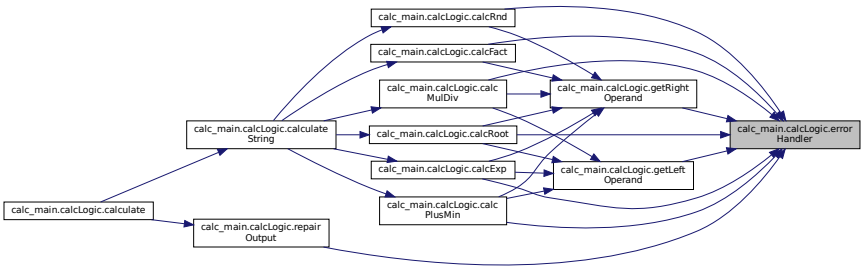
7.1.3.17 errorHandler() def calc_main.calcLogic.errorHandler (self, err_msg)

Handles error printing onto the main display and further setting of tags.

Parameters

err_msg	Error message that will be printed on the display

Here is the caller graph for this function:



7.1.3.18 findAllPositions() def calc_main.calcLogic.findAllPositions (self, pattern, str)

Finds all positions of given patterns in string and returns them in a list.

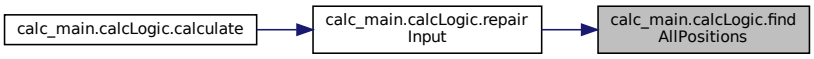
Parameters

pattern	Pattern the function is looking for
str	String that's being searched for the sought pattern

Returns

`positions` List with all the positions of sought pattern

Here is the caller graph for this function:



7.1.3.19 findParPairs() `def calc_main.calcLogic.findParPairs (`

self,
text)

Finds corresponding pairs of parentheses.

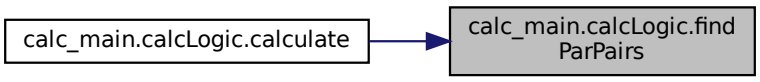
Parameters

text	Text that's being searched

Returns

`pairs` Dictionary with parenthesis pairs

Here is the caller graph for this function:



7.1.3.20 getLeftOperand() `def calc_main.calcLogic.getLeftOperand (`

self,
text,
pos)

Finds the left operand of an operation which is on a given position in a given text.

Parameters

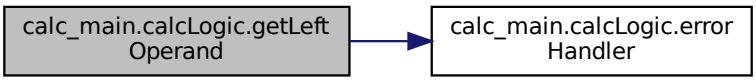
text	Text in which we are searching for the operand
pos	Position of the operand in the text

Returns

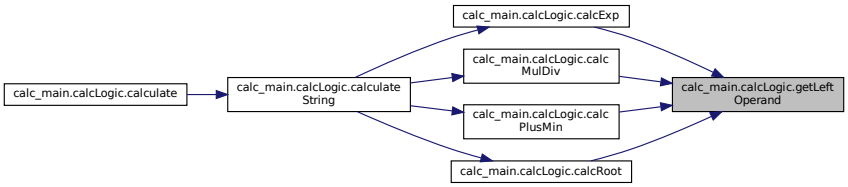
`left_op`

None if the operand is out of bounds

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.21 getRightOperand() `def calc_main.calcLogic.getRightOperand ( self, text, pos )`

Finds the right operand of an operation which is on a given position in a given text.

Parameters

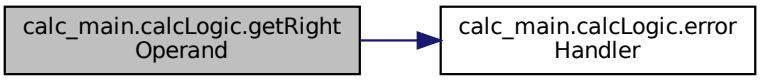
text	Text in which we are searching for the operand
pos	Position of the operand in the text

Returns

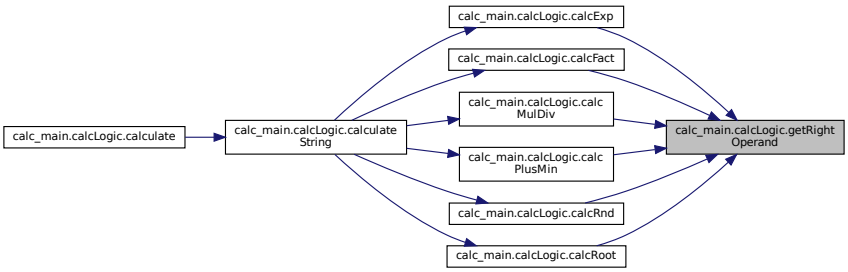
`right_op`

None if the operand is out of bounds

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.22 memClear() `def calc_main.calcLogic.memClear ( self )`

Clears the memory.

7.1.3.23 memLoad() `def calc_main.calcLogic.memLoad ( self )`

Loads text from memory to main display (if not empty)

7.1.3.24 memSet() `def calc_main.calcLogic.memSet ( self )`

Stores text displayed on main display to memory.

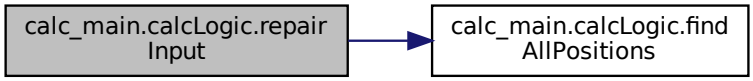
7.1.3.25 oPDF_g() def calc_main.calcLogic.oPDF_g (self)

Opens Guide PDF on a specific system (Windows/Linux)

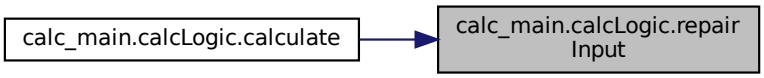
7.1.3.26 repairInput() def calc_main.calcLogic.repairInput (self)

Repairs any syntax errors still present in the input string.

Here is the call graph for this function:



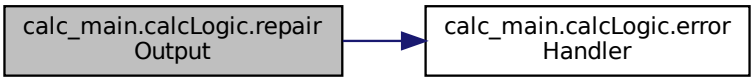
Here is the caller graph for this function:



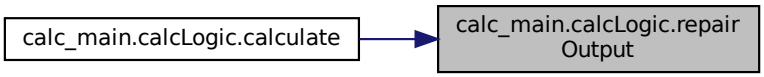
7.1.3.27 repairOutput() def calc_main.calcLogic.repairOutput (self)

Repairs the format of the output.

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.3.28 sColor() `def calc_main.calcLogic.sColor (`

self,
dark)

Function for UI color change (dark/white)

7.1.4 Member Data Documentation

7.1.4.1 bin_ops `calc_main.calcLogic.bin_ops`

List of basic binary operands ('+','-','/','∗','^')

7.1.4.2 dec_p `calc_main.calcLogic.dec_p`

Bool that keeps track of whether a decimal point can be placed.

7.1.4.3 error `calc_main.calcLogic.error`

Bool that keeps track of whether an error has occured.

7.1.4.4 md_text `calc_main.calcLogic.md_text`

Text displayed on the main display.

7.1.4.5 memory `calc_main.calcLogic.memory`

Variable stores a string that can later be loaded to the main display.

7.1.4.6 open_par `calc_main.calcLogic.open_par`

Number of open parentheses.

7.1.4.7 parentheses `calc_main.calcLogic.parentheses`

List of parenthesis characters ('(',')')

7.1.4.8 result `calc_main.calcLogic.result`

Bool that informs us about whether a result from previous calculation is currently being shown.

7.1.4.9 sd_text `calc_main.calcLogic.sd_text`

Text displayed on the secondary (upper) display.

7.1.4.10 un_ops `calc_main.calcLogic.un_ops`

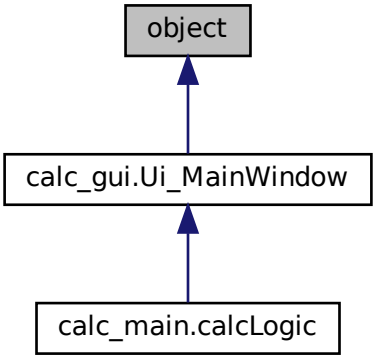
List of "unary" operands (root,'!') (although root is more of a binary operand it behaves more like factorial)

The documentation for this class was generated from the following file:

- calc_main.py

7.2 object Class Reference

Inheritance diagram for object:



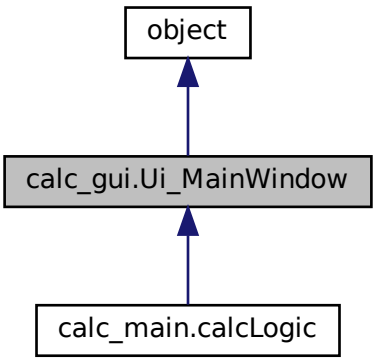
The documentation for this class was generated from the following file:

- calc_gui.py

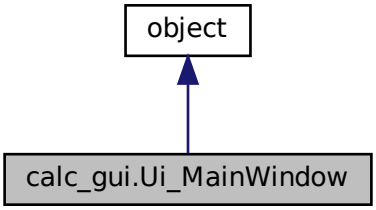
7.3 calc_gui.Ui_MainWindow Class Reference

Class responsible for the proper look of GUI of the calculator.

Inheritance diagram for calc_gui.Ui_MainWindow:



Collaboration diagram for calc_gui.Ui_MainWindow:



Public Member Functions

- def setupUi (self, MainWindow)
- def retranslateUi (self, MainWindow)

Public Attributes

- centralwidget
- frame

  The frame of the calculator.
- n_button_0
- n_button_1
- n_button_2
- n_button_3
- n_button_4
- n_button_5
- n_button_6
- n_button_7
- n_button_8
- n_button_9
- button_plus
- button_minus
- button_multiply
- button_divide
- button_fact
- button_root
- button_sroot
- n_button_sign
- n_button_h_dot
- n_button_comma
- button_parent_o
- button_parent_c
- button_ms
- button_mc
- button_ml
- button_random
- button_delete

- button_ce
- h_equal_button
- equal_button
- main_display
- h_display
- line
- line_2
- menubar
- menuMenu
- actionDark_mode
- actionHelp
- pWin
- textPwin
- lName
- lVersion
- actionInformation

7.3.1 Detailed Description

Class responsible for the proper look of GUI of the calculator.

7.3.2 Member Function Documentation

7.3.2.1 retranslateUi() `def calc_gui.Ui_MainWindow.retranslateUi (`

self,
MainWindow)

7.3.2.2 setupUi() `def calc_gui.Ui_MainWindow.setupUi (`

self,
MainWindow)

7.3.3 Member Data Documentation

7.3.3.1 actionDark_mode `calc_gui.Ui_MainWindow.actionDark_mode`

7.3.3.2 actionHelp `calc_gui.Ui_MainWindow.actionHelp`

7.3.3.3 actionInformation calc_gui.Ui_MainWindow.actionInformation

7.3.3.4 button_ce calc_gui.Ui_MainWindow.button_ce

7.3.3.5 button_delete calc_gui.Ui_MainWindow.button_delete

7.3.3.6 button_divide calc_gui.Ui_MainWindow.button_divide

7.3.3.7 button_fact calc_gui.Ui_MainWindow.button_fact

7.3.3.8 button_mc calc_gui.Ui_MainWindow.button_mc

7.3.3.9 button_minus calc_gui.Ui_MainWindow.button_minus

7.3.3.10 button_ml calc_gui.Ui_MainWindow.button_ml

7.3.3.11 button_ms calc_gui.Ui_MainWindow.button_ms

7.3.3.12 button_multiply calc_gui.Ui_MainWindow.button_multiply

7.3.3.13 button_parent_c calc_gui.Ui_MainWindow.button_parent_c

7.3.3.14 button_parent_o calc_gui.Ui_MainWindow.button_parent_o

7.3.3.15 button_plus calc_gui.Ui_MainWindow.button_plus

7.3.3.16 button_random calc_gui.Ui_MainWindow.button_random

7.3.3.17 button_root calc_gui.Ui_MainWindow.button_root

7.3.3.18 button_sroot calc_gui.Ui_MainWindow.button_sroot

7.3.3.19 centralwidget calc_gui.Ui_MainWindow.centralwidget

7.3.3.20 equal_button calc_gui.Ui_MainWindow.equal_button

7.3.3.21 frame calc_gui.Ui_MainWindow.frame

The frame of the calculator.

7.3.3.22 h_display calc_gui.Ui_MainWindow.h_display

7.3.3.23 h_equal_button calc_gui.Ui_MainWindow.h_equal_button

7.3.3.24 line calc_gui.Ui_MainWindow.line

7.3.3.25 line_2 calc_gui.Ui_MainWindow.line_2

7.3.3.26 lName calc_gui.Ui_MainWindow.lName

7.3.3.27 lVersion calc_gui.Ui_MainWindow.lVersion

7.3.3.28 main_display calc_gui.Ui_MainWindow.main_display

7.3.3.29 menubar calc_gui.Ui_MainWindow.menubar

7.3.3.30 menuMenu calc_gui.Ui_MainWindow.menuMenu

7.3.3.31 n_button_0 calc_gui.Ui_MainWindow.n_button_0

7.3.3.32 n_button_1 calc_gui.Ui_MainWindow.n_button_1

7.3.3.33 n_button_2 calc_gui.Ui_MainWindow.n_button_2

7.3.3.34 n_button_3 calc_gui.Ui_MainWindow.n_button_3

7.3.3.35 n_button_4 calc_gui.Ui_MainWindow.n_button_4

7.3.3.36 n_button_5 calc_gui.Ui_MainWindow.n_button_5

7.3.3.37 n_button_6 calc_gui.Ui_MainWindow.n_button_6

7.3.3.38 n_button_7 calc_gui.Ui_MainWindow.n_button_7

7.3.3.39 n_button_8 calc_gui.Ui_MainWindow.n_button_8

7.3.3.40 n_button_9 calc_gui.Ui_MainWindow.n_button_9

7.3.3.41 n_button_comma calc_gui.Ui_MainWindow.n_button_comma

7.3.3.42 n_button_h_dot calc_gui.Ui_MainWindow.n_button_h_dot

7.3.3.43 n_button_sign calc_gui.Ui_MainWindow.n_button_sign

7.3.3.44 pWin calc_gui.Ui_MainWindow.pWin

7.3.3.45 textPwin calc_gui.Ui_MainWindow.textPwin

The documentation for this class was generated from the following file:

- calc_gui.py

8 File Documentation

8.1 1000_num.txt File Reference

8.2 100_num.txt File Reference

8.3 10_num.txt File Reference

8.4 calc_gui.py File Reference

The interface of the calculator.

Classes

- class calc_gui.Ui_MainWindow

  Class responsible for the proper look of GUI of the calculator.

Namespaces

- calc_gui

8.4.1 Detailed Description

The interface of the calculator.

Author

Martin Talajka

Date

19.4.2021

8.5 calc_main.py File Reference

The main logic of the calculator.

Classes

- class calc_main.calcLogic

  Class responsible for the logical aspect of the calculator.

Namespaces

- calc_main

Variables

- calc_main.app = QtWidgets.QApplication(sys.argv)
- calc_main.MainWindow = QtWidgets.QMainWindow()
- calc_main.ui = calcLogic()

8.5.1 Detailed Description

The main logic of the calculator.

Author

Martin Talajka

Ondrej Kováč

Date

21.4.2021

8.6 mathlib.py File Reference

Math library defining math operations (+,-,∗,/,!,^,nth_root, RNG)

Namespaces

- mathlib

Functions

- def mathlib.add (a, b)

  Sum of 2 numbers.
- def mathlib.sub (a, b)

  Subtraction of 2 numbers.
- def mathlib.mul (a, b)

  Product of 2 numbers.
- def mathlib.div (a, b)

  Division of 2 numbers.
- def mathlib.fact (n)

  Factorial of a whole number.
- def mathlib.exp (b, n)

  Exponentiation of a base b by an exponent n.
- def mathlib.root (n, x)

  Finding n th root of number x.
- def mathlib.rng (x)

  Producing a random number in a given range.

8.6.1 Detailed Description

Math library defining math operations (+,-,∗,/,!,^,nth_root, RNG)

Author

Ondrej Kováč
Martin Talajka (optimization)

Date

13.4.2021

Index