Python calculator

Generated by Doxygen 1.9.3

Chapter 1

Python calculator VUT FIT IVS project

1.1 Description

Calculator application developed in Python.

Authors

Vladimir Azarov (xazaro00)

Janos Laszlo Vasik (xvasik05)

Lucia Balazova (xbalaz18)

Nikolas Ospaly (xospal01)

This program is licensed under the GNU General Public License v3.0.

Chapter 2

Namespace Index

2.1 Packages

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

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

Chapter 4

Namespace Documentation

4.1 calc Namespace Reference

Functions

- def click_0 ()

  Inputs a "0".
- def click_1 ()

  Inputs a "1".
- def click_2 ()

  Inputs a "2".
- def click_3 ()

  Inputs a "3".
- def click_4 ()

  Inputs a "4".
- def click_5 ()

  Inputs a "5".
- def click_6 ()

  Inputs a "6".
- def click_7 ()

  Inputs a "7".
- def click_8 ()

  Inputs a "8".
- def click_9 ()

  Inputs a "9".
- def click_add ()

  Inputs a "+", to calculate addition.
- def click_clear ()

  Resets the calculator.
- def click_decimal ()

  Inputs a decimal separator.
- def click_delete ()

  Deletes the last character from user input.
- def click_div ()

  Inputs a "/", to calculate division.
- def click_fac ()

Inputs a "!", to calculate factorial.

- def click_mod ()

  Inputs a "%", to calculate modulo.
- def click_mul ()

  Inputs a "∗", to calculate multiplication.
- def click_pow ()

  Inputs a "^ ", to calculate n-th power.
- def click_roo ()

  Inputs a root sign, to calculate root.
- def click_sub ()

  Inputs a "-", to calculate subtraction.
- def double_input ()

  Checks for double input.
- def equals ()

  Calculates the result of the input equation, and prints it out in the GUI.
- def function_executioner (user_input)

  Executes currently entered operation.
- def input_formating (user_input)

  Formats user input into a form suitable for the program.
- def last_op (user_input)

  Returns true if the last character of the input is an operator.
- def show_cache ()

  Deletes the current input and replaces it with last result.

Variables

- background

  Color of background in GUI.
- int char_limit = 30

  Number of maximum characters in input/output.
- string current_val = ""

  Current equation in cache.
- d_num = tk.StringVar(window)

  Current output shown to user in GUI.
- list default_set = ["#a5c663", "#354f00", "#7b9f35", "#d4ee9f"]

  List of color schemes.
- display = tk.Label(window,textvariable=d_num,font= 30)

  Text label of current output.
- head_menu = tk.Menu(window)

  Main menu.
- help_menu = tk.Menu(head_menu, tearoff=0)

  Sub-menu with help options.
- key_0 = tk.Button(window,text="0",command=click_0,bg=default_set[0],fg=default_set[1])\

  Button for inputting a "0".
- key_1 = tk.Button(window,text="1",command=click_1,bg=default_set[0],fg=default_set[1])\

  Button for inputting a "1".
- key_1_cache = tk.Button(window,text="CACHE",command=show_cache, bg=default_set[0],fg=default_set[1])\

  Button for showing last result.
- key_2 = tk.Button(window,text="2",command=click_2,bg=default_set[0],fg=default_set[1])\

  Button for inputting a "2".

- key_3 = tk.Button(window,text="3",command=click_3,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "3".
- key_4 = tk.Button(window,text="4",command=click_4,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "4".
- key_5 = tk.Button(window,text="5",command=click_5,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "5".
- key_6 = tk.Button(window,text="6",command=click_6,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "6".
- key_7 = tk.Button(window,text="7",command=click_7,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "7".
- key_8 = tk.Button(window,text="8",command=click_8,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "8".
- key_9 = tk.Button(window,text="9",command=click_9,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "9".
- key_add = tk.Button(window,text="+",command =click_add,bg=default_set[0],fg=default_set[1])\
  Button for calculating addition.
- key_clear = tk.Button(window,text="CLEAR",command =click_clear,bg=default_set[0],fg=default_set[1])\
  Button for clearing all user input.
- key_decimal = tk.Button(window,text=",",command=click_decimal,bg=default_set[0],fg=default_set[1])\
  Button for inputting a decimal separator.
- key_delete = tk.Button(window,text="DELETE",command =click_delete,bg=default_set[0],fg=default_set[1])\
  Button for deleting the last character.
- key_div = tk.Button(window,text="/",command =click_div,bg=default_set[0],fg=default_set[1])\
  Button for calculating division.
- key_equals = tk.Button(window,text="=",command=equals,bg=default_set[0],fg=default_set[1])\
  Button for calculating and showing result.
- key_fac = tk.Button(window,text="!",command =click_fac,bg=default_set[0],fg=default_set[1])\
  Button for calculating factorial.
- key_mod = tk.Button(window,text="%",command =click_mod,bg=default_set[0],fg=default_set[1])\
  Button for calculating modulo.
- key_mul = tk.Button(window,text="∗",command =click_mul,bg=default_set[0],fg=default_set[1])\
  Button for calculating multiplication.
- key_pow = tk.Button(window,text="^",command =click_pow,bg=default_set[0],fg=default_set[1])\
  Button for calculating n-th power.
- key_roo = tk.Button(window,text="√",command =click_roo,bg=default_set[0],fg=default_set[1])\
  Button for calculating n-th root.
- key_sub = tk.Button(window,text="-",command =click_sub,bg=default_set[0],fg=default_set[1])\
  Button for calculating subtraction.
- string l_res = ""\
  Result of last operation.
- bool operation_c = False\
  Boolean for catching douple operation.
- list operators = ["+","∗","/","%","^","!","√","-"]\
  List of valid operators.
- string solution = current_val\
  Result of current equation.
- window = tk.Tk()\
  Main window of the graphical inteface.

4.1.1 Function Documentation

4.1.1.1 click_0()

```
def calc.click_0 ( )
```

Inputs a "0".

4.1.1.2 click_1()

```
def calc.click_1 ( )
```

Inputs a "1".

4.1.1.3 click_2()

```
def calc.click_2 ( )
```

Inputs a "2".

4.1.1.4 click_3()

```
def calc.click_3 ( )
```

Inputs a "3".

4.1.1.5 click_4()

```
def calc.click_4 ( )
```

Inputs a "4".

4.1.1.6 click_5()

```
def calc.click_5 ( )
```

Inputs a "5".

4.1.1.7 click_6()

```
def calc.click_6 ( )
```

Inputs a "6".

4.1.1.8 click_7()

```
def calc.click_7 ( )
```

Inputs a "7".

4.1.1.9 click_8()

```
def calc.click_8 ( )
```

Inputs a "8".

4.1.1.10 click_9()

```
def calc.click_9 ( )
```

Inputs a "9".

4.1.1.11 click_add()

```
def calc.click_add ( )
```

Inputs a "+", to calculate addition.

4.1.1.12 click_clear()

```
def calc.click_clear ( )
```

Resets the calculator.

(empties current values and operation)

4.1.1.13 click_decimal()

```
def calc.click_decimal ( )
```

Inputs a decimal separator.

4.1.1.14 click_delete()

```
def calc.click_delete ( )
```

Deletes the last character from user input.

4.1.1.15 click_div()

```
def calc.click_div ( )
```

Inputs a "/", to calculate division.

4.1.1.16 click_fac()

```
def calc.click_fac ( )
```

Inputs a "!", to calculate factorial.

4.1.1.17 click_mod()

```
def calc.click_mod ( )
```

Inputs a "%", to calculate modulo.

4.1.1.18 click_mul()

```
def calc.click_mul ( )
```

Inputs a "∗", to calculate multiplication.

4.1.1.19 click_pow()

```
def calc.click_pow ( )
```

Inputs a "^", to calculate n-th power.

4.1.1.20 click_roo()

```
def calc.click_roo ( )
```

Inputs a root sign, to calculate root.

4.1.1.21 click_sub()

```
def calc.click_sub ( )
```

Inputs a "-", to calculate subtraction.

4.1.1.22 double_input()

```
def calc.double_input ( )
```

Checks for double input.

If it is caught, it calculates the first equation.

4.1.1.23 equals()

```
def calc.equals ( )
```

Calculates the result of the input equation, and prints it out in the GUI.

4.1.1.24 function_executioner()

```
def calc.function_executioner (
              user_input )
```

Executes currently entered operation.

Parameters

user_input	Input from user.

Returns

Result from operation.

4.1.1.25 input_formating()

```
def calc.input_formating (
              user_input )
```

Formats user input into a form suitable for the program.

Parameters

user_input	Input from user.

Returns

Formatted input from user.

4.1.1.26 last_op()

```
def calc.last_op (
              user_input )
```

Returns true if the last character of the input is an operator.

Parameters

user_input	Input from user.

Returns

True/False.

4.1.1.27 show_cache()

```
def calc.show_cache ( )
```

Deletes the current input and replaces it with last result.

4.1.2 Variable Documentation

4.1.2.1 background

```
background
```

Color of background in GUI.

4.1.2.2 char_limit

```
int char_limit = 30
```

Number of maximum characters in input/output.

4.1.2.3 current_val

```
string current_val = ""
```

Current equation in cache.

4.1.2.4 d_num

```
d_num = tk.StringVar(window)
```

Current output shown to user in GUI.

4.1.2.5 default_set

```
list default_set = ["#a5c663", "#354f00", "#7b9f35", "#d4ee9f"]
```

List of color schemes.

4.1.2.6 display

```
display = tk.Label(window,textvariable=d_num,font= 30)
```

Text label of current output.

4.1.2.7 head_menu

```
head_menu = tk.Menu(window)
```

Main menu.

4.1.2.8 help_menu

```
help_menu = tk.Menu(head_menu, tearoff=0)
```

Sub-menu with help options.

4.1.2.9 key_0

```
key_0 = tk.Button(window,text="0",command=click_0,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "0".

4.1.2.10 key_1

```
key_1 = tk.Button(window,text="1",command=click_1,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "1".

4.1.2.11 key_1_cache

```
key_1_cache = tk.Button(window,text="CACHE",command=show_cache, bg=default_set[0],fg=default_set[1])\
```

Button for showing last result.

4.1.2.12 key_2

```
key_2 = tk.Button(window,text="2",command=click_2,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "2".

4.1.2.13 key_3

```
key_3 = tk.Button(window,text="3",command=click_3,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "3".

4.1.2.14 key_4

```
key_4 = tk.Button(window,text="4",command=click_4,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "4".

4.1.2.15 key_5

```
key_5 = tk.Button(window,text="5",command=click_5,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "5".

4.1.2.16 key_6

```
key_6 = tk.Button(window,text="6",command=click_6,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "6".

4.1.2.17 key_7

```
key_7 = tk.Button(window,text="7",command=click_7,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "7".

4.1.2.18 key_8

```
key_8 = tk.Button(window,text="8",command=click_8,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "8".

4.1.2.19 key_9

```
key_9 = tk.Button(window,text="9",command=click_9,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a "9".

4.1.2.20 key_add

```
key_add = tk.Button(window,text="+",command =click_add,bg=default_set[0],fg=default_set[1])\
```

Button for calculating addition.

4.1.2.21 key_clear

```
key_clear = tk.Button(window,text="CLEAR",command =click_clear,bg=default_set[0],fg=default_set[1])\
```

Button for clearing all user input.

4.1.2.22 key_decimal

```
key_decimal = tk.Button(window,text=",",command=click_decimal,bg=default_set[0],fg=default_set[1])\
```

Button for inputting a decimal separator.

4.1.2.23 key_delete

```
key_delete = tk.Button(window,text="DELETE",command =click_delete,bg=default_set[0],fg=default_set[1])\
```

Button for deleting the last character.

4.1.2.24 key_div

```
key_div = tk.Button(window,text="/",command =click_div,bg=default_set[0],fg=default_set[1])\
```

Button for calculating division.

4.1.2.25 key_equals

```
key_equals = tk.Button(window,text="=",command=equals,bg=default_set[0],fg=default_set[1])\
```

Button for calculating and showing result.

4.1.2.26 key_fac

```
key_fac = tk.Button(window,text="!",command =click_fac,bg=default_set[0],fg=default_set[1])\
```

Button for calculating factorial.

4.1.2.27 key_mod

```
key_mod = tk.Button(window,text="%",command =click_mod,bg=default_set[0],fg=default_set[1])\
```

Button for calculating modulo.

4.1.2.28 key_mul

```
key_mul = tk.Button(window,text="*",command =click_mul,bg=default_set[0],fg=default_set[1])\
```

Button for calculating multiplication.

4.1.2.29 key_pow

```
key_pow = tk.Button(window,text="^",command =click_pow,bg=default_set[0],fg=default_set[1])\
```

Button for calculating n-th power.

4.1.2.30 key_roo

```
key_roo = tk.Button(window,text="√",command =click_roo,bg=default_set[0],fg=default_set[1])\
```

Button for calculating n-th root.

4.1.2.31 key_sub

```
key_sub = tk.Button(window,text="-",command =click_sub,bg=default_set[0],fg=default_set[1])\
```

Button for calculating subtraction.

4.1.2.32 l_res

```
string l_res = ""
```

Result of last operation.

4.1.2.33 operation_c

```
operation_c = False
```

Boolean for catching douple operation.

4.1.2.34 operators

```
list operators = ["+","*","/","%","^","!","√","-"]
```

List of valid operators.

4.1.2.35 solution

```
string solution = current_val
```

Result of current equation.

4.1.2.36 window

```
window = tk.Tk()
```

Main window of the graphical inteface.

4.2 math_lib Namespace Reference

Functions

- def add (first_value, second_value)

  Adds 2 numbers.
- def div (first_value, second_value)

  Divides first number by the second.
- def exp (first_value, second_value)

  Exponentiates first number to the second number.
- def fact (first_value)

  Calculates the factorial of the number.
- def mod (first_value, second_value)

  Calculates remainder (modulo) after the first number divided by the second number.
- def mul (first_value, second_value)

  Multiplies 2 numbers.
- def root (first_value, second_value)

  Calculates n-th root of the first number.
- def sub (first_value, second_value)

  Substracts 2 numbers.

4.2.1 Function Documentation

4.2.1.1 add()

```
def math_lib.add (
              first_value,
              second_value )
```

Adds 2 numbers.

Parameters

first_value	The first summand.
second_value	The second summand.

Returns

Sum of summands represented by float number rounded by 10 decimal places.

4.2.1.2 div()

```
def math_lib.div (
              first_value,
              second_value )
```

Divides first number by the second.

Will raise an expection in case of dividing by zero.

Parameters

first_value	Divident.
second_value	Divisor.

Returns

Quotient represented by float number rounded by 10 decimal places.

4.2.1.3 exp()

```
def math_lib.exp (
              first_value,
              second_value )
```

Exponentiates first number to the second number.

Parameters

first_value	Base.
second_value	Exponent.

Returns

Power represented by float number rounded by 10 decimal places.

4.2.1.4 fact()

```
def math_lib.fact (
              first_value )
```

Calculates the factorial of the number.

Parameters

first_value	Radicant.
second_value	Degree.

Returns

Product represented by an integer number.

4.2.1.5 mod()

```
def math_lib.mod (
              first_value,
              second_value )
```

Calculates remainder (modulo) after the first number divided by the second number.

Parameters

first_value	Divident.
second_value	Divisor.

Returns

Remainder represented by float number rounded by 10 decimal places.

4.2.1.6 mul()

```
def math_lib.mul (
              first_value,
              second_value )
```

Multiplies 2 numbers.

Parameters

first_value	The first factor.
second_value	The second factor.

Returns

Product of factors represented by float number rounded by 10 decimal places.

4.2.1.7 root()

```
def math_lib.root (
              first_value,
              second_value )
```

Calculates n-th root of the first number.

Degree is determined by the second number.

Parameters

first_value	Radicant.
second_value	Degree.

Returns

Root represented by float number rounded by 10 decimal places.

4.2.1.8 sub()

```
def math_lib.sub (
              first_value,
              second_value )
```

Substracts 2 numbers.

Parameters

first_value	Minuend.
second_value	Subtrahend.

Returns

Difference between minuend and subtrahend represented by float number rounded by 10 decimal places.

4.3 stddev Namespace Reference

Functions

- def calc_arithm_mean (data)
- def calc_std_dev (arithm_mean, data)
- def main ()

4.3.1 Function Documentation

4.3.1.1 calc_arithm_mean()

```
def stddev.calc_arithm_mean (
              data )
```

4.3.1.2 calc_std_dev()

```
def stddev.calc_std_dev (
              arithm_mean,
              data )
```

4.3.1.3 main()

```
def stddev.main ( )
```

Chapter 5

File Documentation

5.1 calc.py File Reference

Calculator source code developed in Python.

Namespaces

- namespace calc

Functions

- def click_0 ()
  Inputs a "0".
- def click_1 ()
  Inputs a "1".
- def click_2 ()
  Inputs a "2".
- def click_3 ()
  Inputs a "3".
- def click_4 ()
  Inputs a "4".
- def click_5 ()
  Inputs a "5".
- def click_6 ()
  Inputs a "6".
- def click_7 ()
  Inputs a "7".
- def click_8 ()
  Inputs a "8".
- def click_9 ()
  Inputs a "9".
- def click_add ()
  Inputs a "+", to calculate addition.
- def click_clear ()

Resets the calculator.

- def click_decimal ()

  Inputs a decimal separator.
- def click_delete ()

  Deletes the last character from user input.
- def click_div ()

  Inputs a "/", to calculate division.
- def click_fac ()

  Inputs a "!", to calculate factorial.
- def click_mod ()

  Inputs a "%", to calculate modulo.
- def click_mul ()

  Inputs a "∗", to calculate multiplication.
- def click_pow ()

  Inputs a "^ ", to calculate n-th power.
- def click_roo ()

  Inputs a root sign, to calculate root.
- def click_sub ()

  Inputs a "-", to calculate subtraction.
- def double_input ()

  Checks for double input.
- def equals ()

  Calculates the result of the input equation, and prints it out in the GUI.
- def function_executioner (user_input)

  Executes currently entered operation.
- def input_formating (user_input)

  Formats user input into a form suitable for the program.
- def last_op (user_input)

  Returns true if the last character of the input is an operator.
- def show_cache ()

  Deletes the current input and replaces it with last result.

Variables

- background

  Color of background in GUI.
- int char_limit = 30

  Number of maximum characters in input/output.
- string current_val = ""

  Current equation in cache.
- d_num = tk.StringVar(window)

  Current output shown to user in GUI.
- list default_set = ["#a5c663", "#354f00", "#7b9f35", "#d4ee9f"]

  List of color schemes.
- display = tk.Label(window,textvariable=d_num,font= 30)

  Text label of current output.
- head_menu = tk.Menu(window)

  Main menu.
- help_menu = tk.Menu(head_menu, tearoff=0)

  Sub-menu with help options.

- key_0 = tk.Button(window,text="0",command=click_0,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "0".
- key_1 = tk.Button(window,text="1",command=click_1,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "1".
- key_1_cache = tk.Button(window,text="CACHE",command=show_cache, bg=default_set[0],fg=default_set[1])\
  Button for showing last result.
- key_2 = tk.Button(window,text="2",command=click_2,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "2".
- key_3 = tk.Button(window,text="3",command=click_3,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "3".
- key_4 = tk.Button(window,text="4",command=click_4,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "4".
- key_5 = tk.Button(window,text="5",command=click_5,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "5".
- key_6 = tk.Button(window,text="6",command=click_6,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "6".
- key_7 = tk.Button(window,text="7",command=click_7,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "7".
- key_8 = tk.Button(window,text="8",command=click_8,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "8".
- key_9 = tk.Button(window,text="9",command=click_9,bg=default_set[0],fg=default_set[1])\
  Button for inputting a "9".
- key_add = tk.Button(window,text="+",command =click_add,bg=default_set[0],fg=default_set[1])\
  Button for calculating addition.
- key_clear = tk.Button(window,text="CLEAR",command =click_clear,bg=default_set[0],fg=default_set[1])\
  Button for clearing all user input.
- key_decimal = tk.Button(window,text=",",command=click_decimal,bg=default_set[0],fg=default_set[1])\
  Button for inputting a decimal separator.
- key_delete = tk.Button(window,text="DELETE",command =click_delete,bg=default_set[0],fg=default_set[1])\
  Button for deleting the last character.
- key_div = tk.Button(window,text="/",command =click_div,bg=default_set[0],fg=default_set[1])\
  Button for calculating division.
- key_equals = tk.Button(window,text="=",command=equals,bg=default_set[0],fg=default_set[1])\
  Button for calculating and showing result.
- key_fac = tk.Button(window,text="!",command =click_fac,bg=default_set[0],fg=default_set[1])\
  Button for calculating factorial.
- key_mod = tk.Button(window,text="%",command =click_mod,bg=default_set[0],fg=default_set[1])\
  Button for calculating modulo.
- key_mul = tk.Button(window,text="∗",command =click_mul,bg=default_set[0],fg=default_set[1])\
  Button for calculating multiplication.
- key_pow = tk.Button(window,text="^",command =click_pow,bg=default_set[0],fg=default_set[1])\
  Button for calculating n-th power.
- key_roo = tk.Button(window,text="$\sqrt{}$",command =click_roo,bg=default_set[0],fg=default_set[1])\
  Button for calculating n-th root.
- key_sub = tk.Button(window,text="-",command =click_sub,bg=default_set[0],fg=default_set[1])\
  Button for calculating subtraction.
- string l_res = ""\
  Result of last operation.
- bool operation_c = False\
  Boolean for catching douple operation.

- list operators = ["+","∗","/","%","^","!","√","-"]

  List of valid operators.
- string solution = current_val

  Result of current equation.
- window = tk.Tk()

  Main window of the graphical inteface.

5.1.1 Detailed Description

Calculator source code developed in Python.

5.1.2 Description

Calculator software with a tkinter GUI, developed in Python.

5.2 math_lib.py File Reference

Library for basic mathematical functions.

Namespaces

- namespace math_lib

Functions

- def add (first_value, second_value)

  Adds 2 numbers.
- def div (first_value, second_value)

  Divides first number by the second.
- def exp (first_value, second_value)

  Exponentiates first number to the second number.
- def fact (first_value)

  Calculates the factorial of the number.
- def mod (first_value, second_value)

  Calculates remainder (modulo) after the first number divided by the second number.
- def mul (first_value, second_value)

  Multiplies 2 numbers.
- def root (first_value, second_value)

  Calculates n-th root of the first number.
- def sub (first_value, second_value)

  Substracts 2 numbers.

5.2.1 Detailed Description

Library for basic mathematical functions.

Library for mathematical functions that includes multiplication, addition, substraction, division, modulo, exponentiation, n-th root and factorial.

5.3 stddev.py File Reference

Namespaces

- namespace stddev

Functions

- def calc_arithm_mean (data)
- def calc_std_dev (arithm_mean, data)
- def main ()

Index