

<b>Started on</b>	Sunday, 25 December 2022, 9:48 PM
<b>State</b>	Finished
<b>Completed on</b>	Sunday, 25 December 2022, 10:46 PM
<b>Time taken</b>	57 mins 46 secs
<b>Marks</b>	10.00/10.00
<b>Grade</b>	<b>5.00</b> out of 5.00 ( <b>100%</b> )

## Question 1

Correct

Mark 10.00 out of 10.00

### Course Level Programming Assignment - Programming a Calculator using Python

#### Objectives

- Extend the functionality of the calculator to save and display the past results of the arithmetic operations

#### Stage 2: Save and display calculation history of the calculator

In this second stage of the assignment you will extend the given calculator program to record the calculations, and recall them as a list using an additional command '?'.

**Task 1:** Study the given code in the answer box and extend it to save each executed operation in a Python List.

- Declare a list to store the previous operations
- Save the operator, operands and the results as a single string, for each operation after each calculation

**Task 2:** implement a history() function to handle the operation '?'

- Display the complete saved list of operations (in the order of execution) using a new command '?'
- If there are no previous calculations when the history '?' command is used, you can display the following message  
"No past calculations to show"

#### For example:

Input	Result
#	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating

Input	Result
+	Select operation.
4	1.Add : +
3	2.Subtract : -
+	3.Multiply : *
6	4.Divide : /
2	5.Power : ^
-	6.Remainder: %
5	7.Terminate: #
2	8.Reset : \$
?	8.History : ?
#	Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 6 Enter second number: 2 6.0 + 2.0 = 8.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5 Enter second number: 2 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.0 + 2.0 = 8.0 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating

Input	Result
+	Select operation.
4	1.Add : +
3	2.Subtract : -
/	3.Multiply : *
6.35	4.Divide : /
2.36	5.Power : ^
-	6.Remainder: %
5.532	7.Terminate: #
2.342	8.Reset : \$
?	8.History : ?
#	Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): / Enter first number: 6.35 Enter second number: 2.36 6.35 / 2.36 = 2.690677966101695 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5.532 Enter second number: 2.342 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.35 / 2.36 = 2.690677966101695 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating

Input	Result
?	Select operation.
#	1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? No past calculations to show Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating

**Answer:** (penalty regime: 0 %)

Reset answer

Ace editor not ready. Perhaps reload page?

Falling back to raw text area.

```
past_calculations = [];

def add(a,b):
    return a+b;

def subtract(a,b):
    return a-b;

def multiply (a,b):
    return a*b;

def divide(a,b):
    try:
        return a/b
    except Exception as e:
        print(e)
def power(a,b):
    return a**b

def remainder(a,b):
    return a%b

def history():
    if past_calculations:
        for index,calc in enumerate(past_calculations):
```

	Input	Expected	Got	
✓	#	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	✓

	Input	Expected	Got	
✓	+ 4 3 + 6 2 - 5 2 ? #	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 6 Enter second number: 2 6.0 + 2.0 = 8.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5 Enter second number: 2 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.0 + 2.0 = 8.0 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 6 Enter second number: 2 6.0 + 2.0 = 8.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5 Enter second number: 2 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.0 + 2.0 = 8.0 5.0 - 2.0 = 3.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	✓

	Input	Expected	Got	
✓	+ 4 3 / 6.35 2.36 - 5.532 2.342 ? #	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): / Enter first number: 6.35 Enter second number: 2.36 6.35 / 2.36 = 2.690677966101695 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5.532 Enter second number: 2.342 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.35 / 2.36 = 2.690677966101695 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): + Enter first number: 4 Enter second number: 3 4.0 + 3.0 = 7.0 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): / Enter first number: 6.35 Enter second number: 2.36 6.35 / 2.36 = 2.690677966101695 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): - Enter first number: 5.532 Enter second number: 2.342 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? 4.0 + 3.0 = 7.0 6.35 / 2.36 = 2.690677966101695 5.532 - 2.342 = 3.19 Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	✓



	Input	Expected	Got	
✓	? #	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? No past calculations to show Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? No past calculations to show Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	✓

	Input	Expected	Got	
✓	/	Select operation.	Select operation.	✓
	45	1.Add : +	1.Add : +	
	0	2.Subtract : -	2.Subtract : -	
	+	3.Multiply : *	3.Multiply : *	
	3	4.Divide : /	4.Divide : /	
	6	5.Power : ^	5.Power : ^	
	?	6.Remainder: %	6.Remainder: %	
	#	7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): /	Enter choice(+,-,*,/,^,%,#,\$,?): /	
		Enter first number: 45	Enter first number: 45	
		Enter second number: 0	Enter second number: 0	
		float division by zero	float division by zero	
		45.0 / 0.0 = None	45.0 / 0.0 = None	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): +	Enter choice(+,-,*,/,^,%,#,\$,?): +	
		Enter first number: 3	Enter first number: 3	
		Enter second number: 6	Enter second number: 6	
		3.0 + 6.0 = 9.0	3.0 + 6.0 = 9.0	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): ?	Enter choice(+,-,*,/,^,%,#,\$,?): ?	
		45.0 / 0.0 = None	45.0 / 0.0 = None	
		3.0 + 6.0 = 9.0	3.0 + 6.0 = 9.0	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): #	Enter choice(+,-,*,/,^,%,#,\$,?): #	
		Done. Terminating	Done. Terminating	

	Input	Expected	Got	
✓	? #	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? No past calculations to show Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): ? No past calculations to show Select operation. 1.Add : + 2.Subtract : - 3.Multiply : * 4.Divide : / 5.Power : ^ 6.Remainder: % 7.Terminate: # 8.Reset : \$ 8.History : ? Enter choice(+,-,*,/,^,%,#,\$,?): # Done. Terminating	✓

	Input	Expected	Got	
✓	?	Select operation.	Select operation.	✓
	-	1.Add : +	1.Add : +	
	2	2.Subtract : -	2.Subtract : -	
	3	3.Multiply : *	3.Multiply : *	
	?	4.Divide : /	4.Divide : /	
	#	5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): ?	Enter choice(+,-,*,/,^,%,#,\$,?): ?	
		No past calculations to show	No past calculations to show	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): -	Enter choice(+,-,*,/,^,%,#,\$,?): -	
		Enter first number: 2	Enter first number: 2	
		Enter second number: 3	Enter second number: 3	
		2.0 - 3.0 = -1.0	2.0 - 3.0 = -1.0	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): ?	Enter choice(+,-,*,/,^,%,#,\$,?): ?	
		2.0 - 3.0 = -1.0	2.0 - 3.0 = -1.0	
		Select operation.	Select operation.	
		1.Add : +	1.Add : +	
		2.Subtract : -	2.Subtract : -	
		3.Multiply : *	3.Multiply : *	
		4.Divide : /	4.Divide : /	
		5.Power : ^	5.Power : ^	
		6.Remainder: %	6.Remainder: %	
		7.Terminate: #	7.Terminate: #	
		8.Reset : \$	8.Reset : \$	
		8.History : ?	8.History : ?	
		Enter choice(+,-,*,/,^,%,#,\$,?): #	Enter choice(+,-,*,/,^,%,#,\$,?): #	
		Done. Terminating	Done. Terminating	

Passed all tests! ✓

Question author's solution (Python3):

Ace editor not ready. Perhaps reload page?

Falling back to raw text area.

```
past_calculations = [];

def add(a,b):
    return a+b;

def subtract(a,b):
    return a-b;

def multiply (a,b):
    return a*b;

def divide(a,b):
    try:
        return a/b
    except Exception as e:
        print(e)
def power(a,b):
    return a**b

def remainder(a,b):
    return a%b

def history():
    if past_calculations:
        for index,calc in enumerate(past_calculations):
```

Correct

Marks for this submission: 10.00/10.00.

## GET IN TOUCH

🏠 University of Moratuwa  
Centre for Open & Distance Learning  
CODL

☎ 011 308 2787/8

☎ 011 265 0301 ext. 3850,3851

✉ open@uom.lk

🌐 [University Website](#)

🌐 [CODL Website](#)

[Data retention summary](#)

 mora\_logo.png Sponsored By  logo.png

f. t. v. i. in. x