

# Python as a Calculator

Blank notebook to be used for class exercises.

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## Exercise 1

Change Hello to Goodbye, then run the cell.

```
In [3]: print("Goodbye year 2020!")
```

Goodbye year 2020!

## Exercise 2

In the cell below, calculate the following expressions (cast to integers using int()):

a	b
$12 + 4$	$12 + 5$
$12 - 4$	$12 - 5$
$12 \times 4$	$12 \times 5$
$12 \div 4$	$12 \div 5$
$12^4$	$12^5$

Which is wrong?

```
In [7]: # This is a comment. Make sure you wrap all the expressions like the example below.  
# Also, create a new cell for each expression (i.e., press the + button in Jupyter Lab)  
# I have done the first one for you. You can create new cells for the others.  
  
int(12 + 4)
```

Out[7]: 16

In [17]: `int(12 + 5)`

Out[17]: 17

In [18]: `int(12 - 4)`

Out[18]: 8

In [19]: `int(12 - 5)`

Out[19]: 7

In [20]: `int(12 * 4)`

Out[20]: 48

In [21]: `int(12 * 5)`

Out[21]: 60

In [22]: `int(12 / 4)`

Out[22]: 3

In [23]: `int(12 / 5)`

Out[23]: 2

In [28]: `int(12 ** 4)`

Out[28]: 20736

In [29]: `int(12 ** 5)`

Out[29]: 248832

## Exercise 3

In a cell for each item, calculate the following expressions one at a time:

1.  $12.0 + 4.0$
2.  $12.0 \div 4.0$
3.  $25.0^{0.5}$
4.  $5.0^{-1.0}$
5.  $5.0 \div 2$

```
In [30]: 12.0 + 4.0
```

```
Out[30]: 16.0
```

```
In [31]: 12.0 / 4.0
```

```
Out[31]: 3.0
```

```
In [32]: 25.0 ** 0.5
```

```
Out[32]: 5.0
```

```
In [33]: 5.0 ** -1.0
```

```
Out[33]: 0.2
```

```
In [34]: 5.0 / 2
```

```
Out[34]: 2.5
```

## Exercise 4

First, predict what the python result will be. Next, in the cell below, calculate the following expressions one at a time:

1. `'Hello, ' + "world!"`
2. `'Hello!' * 3`
3. `" * 10000000000` # two adjacent single quotes
4. `'4' + '2'`

```
In [47]: # 1. Hello, world!
```

```
print('Hello, ' + "world!")
```

Hello, world!

```
In [38]: # 2. Hello!Hello!Hello!  
print('Hello!' * 3)
```

Hello!Hello!Hello!

```
In [41]: # 3.  
print(' ' * 10000000000)
```

```
In [42]: # 4. 42  
print('4' + '2')
```

42

## Exercise 5

Predict whether Python will print True or False before you type the following expressions.

1.  $1 > 2$  or  $2 > 1$
2.  $1 > 2$  or not  $2 > 1$
3. not True
4.  $1 > 2$  or True

```
In [53]: # 1. True  
1 > 2 or 2 > 1
```

Out[53]: True

```
In [52]: # 2. False  
1 > 2 or not 2 > 1
```

Out[52]: False

```
In [54]: # 3. False  
not True
```

Out[54]: False

```
In [55]: #4. True  
1 > 2 or True
```

```
Out[55]: True
```

## Exercise 6

Write the if, elif, else statements to process a score between 0.0 and 1.0. If the score is out of range, print an error message. If the score is between 0.0 and 1.0, print the grade using the following table:

Score	Grade
$\geq 0.9$	A
$\geq 0.8$	B
$\geq 0.7$	C
$\geq 0.6$	D
$< 0.6$	F

```
In [81]: score = 0.93
```

```
In [82]: # Delete the example if and else, then write code here  
if score >= 0.9 and score <= 1.0:  
    print("Your grade is 'A'")  
elif score >= 0.8 and score < 0.9:  
    print("Your grade is 'B'")  
elif score >= 0.7 and score < 0.8:  
    print("Your grade is 'C'")  
elif score >= 0.6 and score < 0.7:  
    print("Your grade is 'D'")  
elif score >= 0.6 and score < 0.6:  
    print("Your grade is 'E'")  
elif score >= 0 and score < 0.6:  
    print("Your grade is 'F'")  
else:  
    print("Error: The score is out of range!")
```

Your grade is 'A'

```
In [84]: #Simplified Solution  
if score < 0 or score > 1.0:
```

```
    print("Error: The score is out of range!")
elif score >= 0.9:
    print("Your grade is 'A'")
elif score >= 0.8:
    print("Your grade is 'B'")
elif score >= 0.7:
    print("Your grade is 'C'")
elif score >= 0.6:
    print("Your grade is 'D'")
elif score >= 0.6:
    print("Your grade is 'E'")
else:
    print("Your grade is 'F'")
```

Your grade is 'A'

In [ ]: