Python Fundamentals

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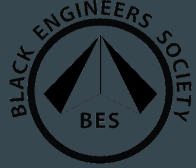
Using Python

https://repl.it/languages/python3



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The Python Shell

```
Python 3.6.1 (default, Dec 2015, 13:05:11)
[GCC 4.8.2] on linux
>>
```

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Math Operations

```
>> 2 + 2
4
>> 4 * 4
16
>> 6 % 4
2
```

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Variables

- Allow you to store values in your program
- Dynamically typed (don't need to worry about type)
- Can be named anything besides a few key words

```
>> x = 15
>> x
15
>> y = 10
>> y
10
```

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Booleans

- Special objects that are either True or False
- Can be assigned to variables

```
>> x = True
>> x
True
>> y = False
>> y
False
```

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Input / Output

- Allows you to take input from the shell and display things to the shell
- Note - Input is read as strings when using the input() function

```
>> x = input()
5
>> x
'5'
>> print(x)
5
```

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Type Casting

- A way you can “cast” variables to different types

```
>> x = x + 5
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: must be str, not int
```

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Type Casting

```
>> x =
int(x) + 5
>> x
10
```

```
>> x = x + str(5)
>> x
'55'
```

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Logical Operators

- These operators return a boolean (True or False)
- Can be assigned to variables

```
>> x = 5
>> x > 6
False
>> x == 5
True
```

```
>> x = 5
>> not x == 10
True
```

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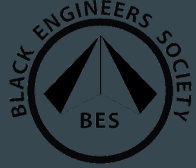
Conditional Statements

- Allow you to have code that executes based on different conditions

```
x = 1
if (x == 0):
  print('x is not 0')

if (x == 0):
  print('x is not 0')
elif (x == 2):
  print('x is not 2')
else:
  print('x contains ' + str(x))
```



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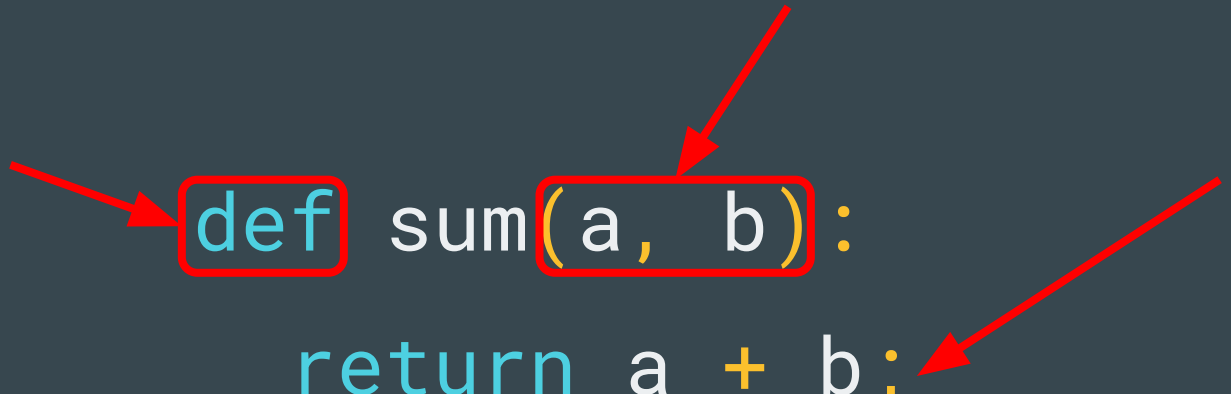
Functions

- Allow you to write reusable code
- A majority of your code will end up in functions



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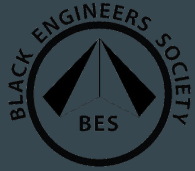
Exercises

- Create a program that given a number prints out whether it is even or odd

- Write a Function that returns the maximum of 2 numbers

- Given 2 numbers, return True if one of them is 10 or their sum is 10



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Lists

- A type of collection that is ordered and mutable
- Index starts at 0

```
a = []
b = ['one', 'two', 'three']
```

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Basic Lists Functionality

```
b = ['one', 'two', 'three']
b.append('four') # ['one', 'two', 'three', 'four']
b.remove('two') # ['one', 'three', 'four']
print(b[2]) # 'four'
b[3] = 4 # Changing value of array item
print(b[3]) # '4'
print(len(b)) # 3
```

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List Conditionals

```
b = ['a', 'b', 'c']
print('a' in b) # True
print('d' in b) # False
```

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For Loops

- Used to iterate over a sequence

```
fruits = ["apple", "banana", "cherry"]
for x in fruits:
  print(x)

for x in "hello":
  print(x)
```

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For Loops

- Note: It works differently than for in other languages as it only iterates over collections

```
for x in range(1,11):
    print(x)
```

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More Exercises

Write a program that prints right triangles given # of row

ie.

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Given a list of n elements, return a list of the elements in reverse order

Ie.

{ 1 , 2 , 3, 4 }

->

{ 4, 3, 2, 1 }

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Learning More Python

- Great Documentation: https://www.python.org/doc/
- https://www.learnpython.org/
- Try some coding challenges at https://www.hackerrank.com/