

Python Basics

CS-2

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Getting Started

1. Open Terminal.
2. Check you have python installed by typing `python -V`
 - a. If you get a Python version number you have it, otherwise you need to install it.
3. Type `python`.
4. At the `>>>` enter `print("Hi")`
5. It should print Hi.
6. Control+D to quit.
7. Open a text editor like Sublime Text.
8. Type `print("Hi")`.
9. File > Save as...
10. Change directory to "student" and name the file `test.py`.
11. Back in Terminal, at the `>` enter `cd /Users/student` (or for a shortcut enter `cd ~`) to change directory to where the file is.
12. Run your program by typing `python test.py`

Variables

A. Integers

```
a = 0
```

```
b = 2
```

```
print(a + b)
```

Output:

```
2
```

B. Strings

```
a = "0"
```

```
b = "2"
```

```
# Print knows + means concat because a and b are Strings.
```

```
print(a + b)
```

Output:

```
02
```

If Statements

A. If, elif and else

```
age = 20
if age >= 25:
    print("You can vote and rent a car.")
elif age >= 18:
    print("You can vote.")
else:
    print("You can't vote or rent a car.")
```

Output:

You can vote.

B. Range

```
age = 16
if age in range(13, 19):
    print("You are a teenager.")
```

Output:

You are a teenager.

While Loops

A. Example

```
a = 1
while a < 7:
    print (a) # by default print adds a newline
    a+=1
```

Output:

```
1
2
3
4
5
6
7
```

For Loops

A. Range

For loop that runs 5 times. Notice that it prints 0 - 4.

```
for a in range(5):  
    print (a)
```

Output:

```
0  
1  
2  
3  
4
```

B. Range (not starting at zero)

```
for a in range(2,5):  
    print (a), # use comma to separate by space not newline
```

Output:

```
2 3 4
```

Lists (Python version of Arrays)

A. Fill list and print a value

```
sampleList = ['t', 'j', 'a', 's']  
print (sampleList[0])
```

Output:

t

B. Print list with for-loop

```
sampleList = ['t', 'j', 'a', 's']  
  
for a in sampleList: # This is like the Java for-each loop.  
    print (a)
```

Output:

t

j

a

s

C. Fill list with range

```
sampleList = ["m" for i in range(10)] # fills with 10 "m"s
```

```
for a in sampleList:  
    print (a)
```

Output:

```
m  
m  
m  
m  
m  
m  
m  
m  
m  
m
```

D. 2D lists

```
# Declare a 2D list and fill with "m"s
rows = ["m" for i in range(4)] # first make a 1D list
grid = [rows for i in range(4)] # then use it to make
                                # another list

# Print all values
for row in grid:
    for val in row:
        print (val), # comma means add space not newline
    print ()
```

Output:

```
m m m m
m m m m
m m m m
m m m m
```

E. Append to a List

```
# Declare an empty list
sampleList = []

# Add elements
sampleList.append('a')
sampleList.append('p')

# Display list
print(sampleList)
```

Output:

```
['a', 'p']
```

Comments

A. Block Comment

```
'''
```

```
Description:
```

```
    This is a sample Python program.
```

```
Author: Michelle Obama
```

```
'''
```

B. Inline comment

```
# this is an one line comment
```

Random Numbers

A. Example

```
# You need to import the random library
```

```
import random
```

```
# Then you can use it to get random ints
```

```
print random.randint(0,9)
```

Output:

(some random number from 0 - 9)

Functions

A. Example

```
# Define a function. Note you do not specify the return type  
# or parameter types.
```

```
def inchesToFeet(inches):  
    return inches/12
```

```
# Print the output of the function  
print(inchesToFeet(36))
```

Output:

3