Class 2 - Starting with Python

[w200] MIDS Python Bridge Course Summer 2018

Week 2 | Agenda

Week 1 Assignment and Polls

Expressions

Objects

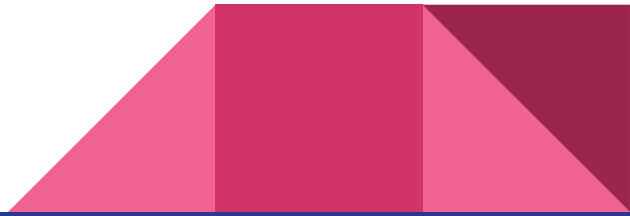
Variables

Strings - Activity 1

Control flow - Activity 2

Breakout - Activity 3

Homework 2



Course Content | First 8 Weeks - Programming

Unit 1 | Introduction, the Command Line, Source Control

Unit 2 | Starting Out with Python

Unit 3 | Sequence Types and Dictionaries

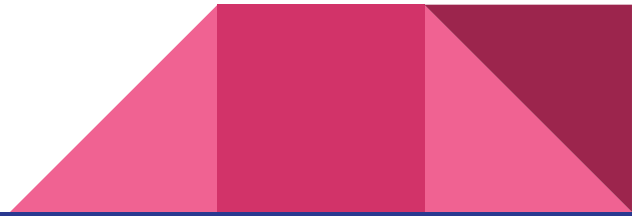
Unit 4 | More About Control and Algorithms

Unit 5 | Functions

Unit 6 | Modules and Packages

Unit 7 | Classes

Unit 8 | Object-Oriented Programming



Review | Logistics

Asynchronous, class meetings, and breakout sessions

Using github to get and submit your assignments
https://github.com/MIDS-INFO-W18/assignments_upstream_summer18

The Google group list
https://groups.google.com/forum/#!forum/w200-python-2018-summer

Course Schedule:
https://docs.google.com/spreadsheets/d/11DxadnNwyFaJIPYLUJSPUlNGCtTenBCR4yaR1CbFBKg

Week 1 Assignment | Check in

- Polls
  - How long did HW1 take?
  - How difficult was HW1 and the general setup?
  - How comfortable are you with the workflow?
  - Is python3/ github/ bash/ jupyter functional?
  - Any questions?

- Show SampleREPO structure

Important Locations | GitHub

Github-playground - Fun code and **student discovered resources**

Assignments_upstream_summer18 - The homework release site, as well as any supplemental class activities

FirstnameLastnameREPO - Your personal HW repository

- We capture this from your week 1 post - **if you change this let us know.**

Course-Syllabus - iPython Notebooks from async and related data

Drills - Additional exercises for fun

Quick Break | Breakouts

Say “Hi!” and tell your partner(s) why you enrolled in MIDS.

Also where you live and your favorite animal (clearly penguins).

Please make sure each member of your breakout room has the ability to “Share Screens”. If not, let your instructor know.

Please make sure each member of your room has “cloned” into all of the repositories listed on the previous screen. Then, please “git pull” the Class 2 Activity file from assignments-upstream.

Send the instructor (me) a message saying you have completed.

Running Python | Four Methods

1. Use the command line.
2. Write a .py script in a text editor. Run it from the command line.
    a. Mac users need to start their file with the location of python. Use the “which python” command in Terminal to find your path:
        i. #!/usr/bin/env
    b. Mac users also **may** need to make the file executable via the command line
        i. `chmod +x file.py`
3. Use a Jupyter Notebook.
4. Use an Integrated Development Environment (IDE) such as Spyder or PyCharm (not in this class).

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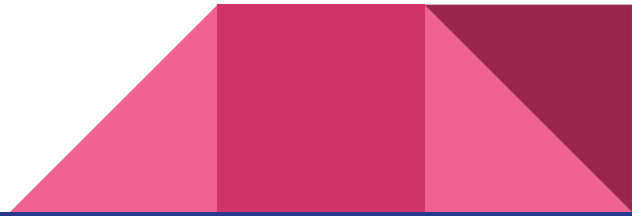

Expressions | Basic math operations

+,-, /,,***

== testing equality

// integer division

% modulus (remainder)

divmod(numerator, denominator)

**** can you think of an application for the modulus**

Expressions | repeated operation shorthand

Cumulative calculation

+=

/=

***=**

-=

...

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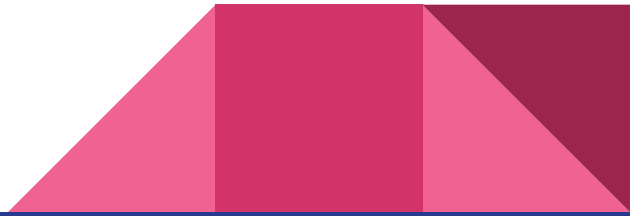
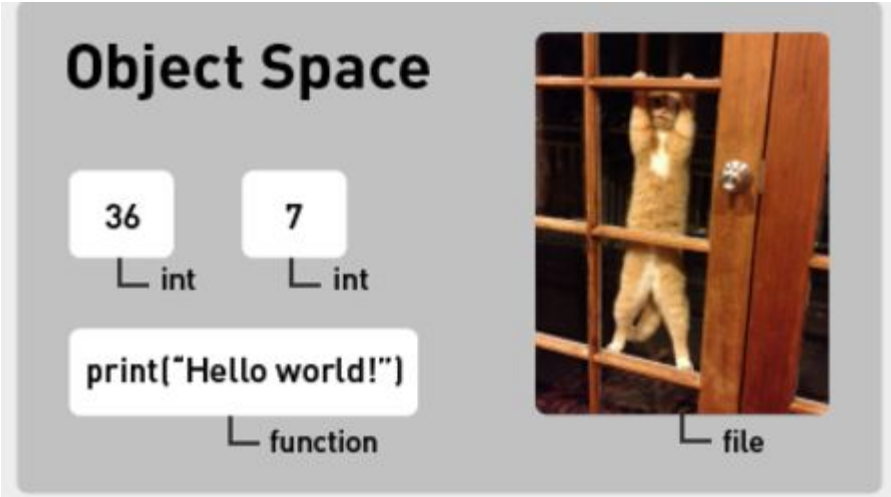


Objects | Basic types (classes)

types
restrict what can be done to an object

Everything in python is an object
every object has a type (class)



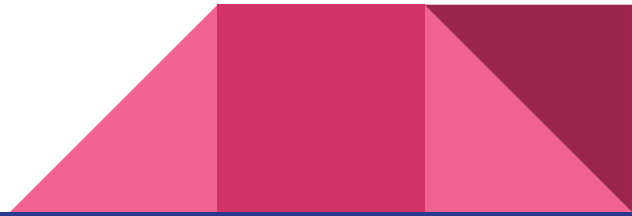
Objects | Basic types (classes)

boolean (bool) - True or False

integers (int) - 1,2,3..

floats (float) - 1.34523

strings (str) - “this is a string”
sequence of characters



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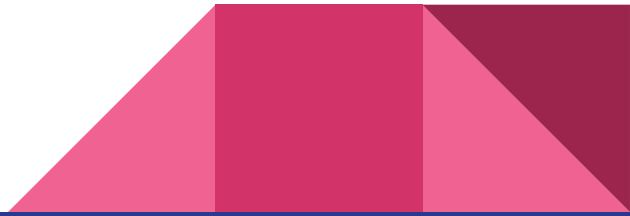
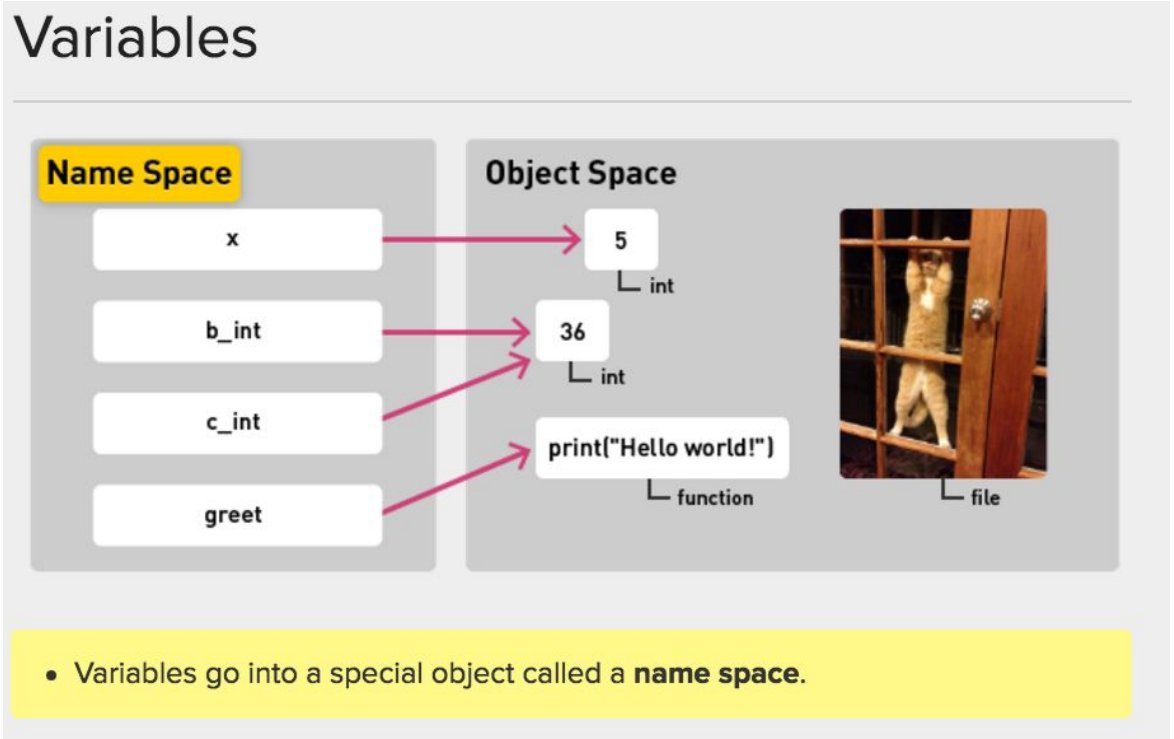


Variables | naming objects

Variables and objects are distinct

Distinct spaces

Objects have types variables do not



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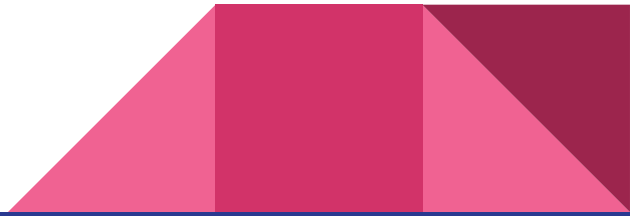

String objects | overview

- String is a sequence object
- We can use **extraction by index**
- **Index starts at 0**
  - think about it the index as an offset
- **Concatenation**
  ‘Cat ’ + ‘Dog’ -> ‘Cat Dog’
- **Multiplication**
  ‘Cat’ * 3 -> ‘CatCatCat’

String slicing | using indices

```
[0]      # the start
[-1]     # one from the end
[0:3]    # from the start to the fourth letter
[1:-1]   # 1 to the second to last
[1:5:2]  # 1 to 5 by 2s
[:-1]    # beginning to second to last
[:]      # whole thing
[::-1]   # start to end reversed
```

String | special characters etc.

‘ or " # to specify strings

“ “ “ # three quotes for block quotes

\ # escape

\n, \t, \” # escape use cases

print (‘somestring’, end= ‘ ‘) # override the newline at end with space

String | functions

<string>.upper()

<string>.lower()

var=input(“your message”) # note it saves strings

str() # type cast a string

String exercises | Try this

1) open your console and create a string variable that prints exactly

The "trouble with

Tribbles" that they

\\\EAT/// too many MREs.

2) using one line of Python code, slice your variable from part 1 to print ‘selbbirT ’ 300 x

selbbirT selbbirT selbbirT selbbirT ….

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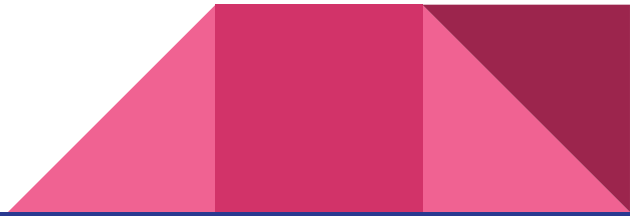


Flow control | conditionals and loops

Deviating from linear programming (scripting)

Flow control element ends with ":"

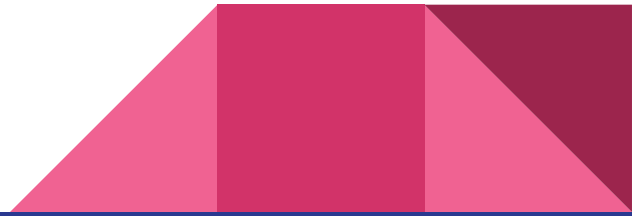
Code suites, noted by indentation

Indented by **4 spaces**

```
countdown = 5
while countdown > 0:
    print(countdown)
    countdown -= 1
print("Blast off!")
```

Conditionals | if, elif, else

```
if x > 2:
    print ( ‘x is greater than 2”)
elif x < 0 :
    print(’x is negative')
else:
    print (‘x is less than 2 but still positive')
```



Control flow exercise | fix this code

```
ans = input( 'do you have 8 legs?’)
if ans == "yes"
print (“you are a spider")
else
ans = input( 'do you have 4 legs?’)
if
print ('you are a quad')
else
if ans == "yes"
else:
print ('you are a bicycle')
```

While loops |

- repeat until condition is satisfied

```
countdown = 5
while countdown > 0:
    print(countdown)
    countdown -= 1
print("Blast off!")
```

```
5
4
3
2
1
Blast off!
```

Nested loops | to repeat an action

```
row = int(input("Enter an integer: "))

# while row >= 0:

j = 0
while j <= row:
    print(j, end=" ")
    j += 1
```

```
Enter an integer: 5
0 1 2 3 4 5
```

```
row = int(input("Enter an integer: "))

while row >= 0:

    # inner loop
    j = 0
    while j <= row:
        print(j, end=" ")
        j += 1

    print("")
    row -= 1
```

```
Enter an integer: 5
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
0
```

Note the use of end = “ ”

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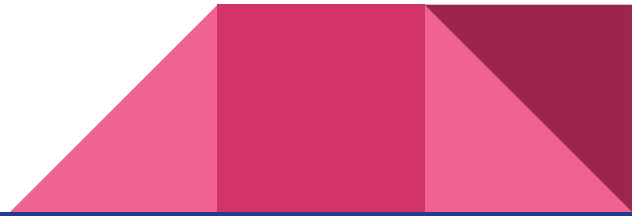

Breakout |

Make a calculator

Work with conditionals (if statements)

Save a .py file and execute it

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