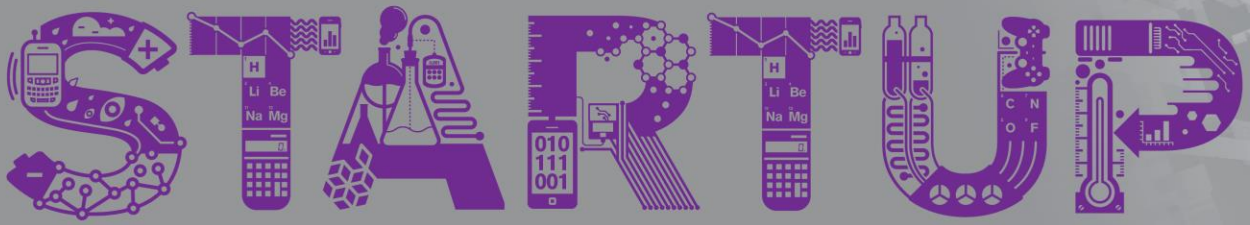
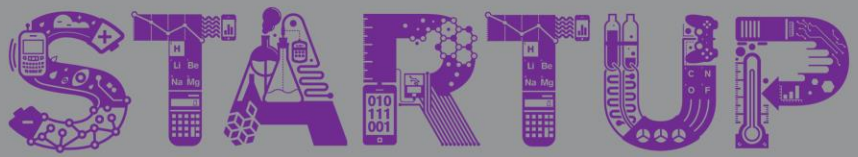
Bloomberg



Bloomberg



Python Lesson 1

Variables

Review: What do these print statements output?

```
print("Hello World!")
print(5)
print(1.2)
print(5 + 1.2)
print("5 + 1.2")
```

```
Hello World!
5
1.2
6.2
5 + 1.2
```

What does this code do?

```
message = "Hello World!"
print(message)
```

```
Hello World!
```

Variables: Introduction

- A **variable** is a name given to a piece of data that can be used to refer to it later.

Variables: Introduction

- A **variable** is a name given to a piece of data that can be used to refer to it later.
- Examples:

```
message = "Hello World!"

favoriteNumber = 23

height_in_inches = 71.5
```

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	
my name	
x	
distance_traveled	
1stPlace	
#ilovecoding	
feet2inches	

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Called camelCase

Variable Name	Allowed?
priceOfOreos	YES
my name	
x	
distance_traveled	
1stPlace	
#ilovecoding	
feet2inches	

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	
distance_traveled	
1stPlace	
#ilovecoding	
feet2inches	

No spaces!

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	
1stPlace	
#ilovecoding	
feet2inches	

But not descriptive

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	YES
1stPlace	
#ilovecoding	
feet2inches	

Called snake_case

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	YES
1stPlace	NO
#ilovecoding	
feet2inches	

Can't begin with numbers!

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	YES
1stPlace	NO
#ilovecoding	NO
feet2inches	

No hashtags!

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	YES
1stPlace	NO
#ilovecoding	NO
feet2inches	YES

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Which of the variable names to the right are allowed?

Variable Name	Allowed?
priceOfOreos	YES
my name	NO
x	YES
distance_traveled	YES
1stPlace	NO
#ilovecoding	NO
feet2inches	YES

Prefer snake_case

Variable Names: Rules

- Contains only upper case letters (A-Z), lower case letters (a-z), numbers (0-9), or _
- Cannot start with a number
- No spaces allowed
- Is case sensitive
- Should describe the meaning of the data

Example: What does this code do?

```
Message = "Hello World!"
print(message)
```

ERROR!

```
Traceback (most recent call last):
  File "/home/ubuntu/workspace/variables.py", line 2, in <module>
    print(message)
NameError: name 'message' is not defined
```

Variables: Individual Practice

- Work on In-class Exercises 1

Variable Types: Introduction

- An **int** or integer is a whole number, either positive or negative

```
int_variable = 5
```

- A **float** is a number with a decimal point

```
float_variable = 1.2
```

- A **string** is a group of characters between quotation marks

```
string_variable = “This is a string variable”
```

Variables and Arithmetic: Group Practice

What does this code do?

```
x = 5
y = 3
print(x + y)
```

```
8
```

Variables and Arithmetic: Group Practice

What does this code do?

```
x = 5
y = 3
print(x + y)

z = x + y
print(z)
```

```
8
```

```
8
```

Variables and Arithmetic: Group Practice

```
x = "cat"
y = "fish"
print(x + y)
```

```
catfish
```

Variables and Arithmetic: Group Practice

```
x = "cat"
y = "fish"
print(x + y)

z = x + y
print(z)
```

```
catfish
```

```
catfish
```

Conclusion: It's okay to use '+' to concatenate strings!

Variables and Arithmetic: Group Practice

```
x = 5
y = 1.2
print(x + y)
```

```
6.2
```

Variables and Arithmetic: Group Practice

```
x = 5
y = 1.2
print(x + y)

z = x + y
print(z)
```

```
6.2
```

```
6.2
```

Conclusion: It's okay to add ints and floats!

Variables and Arithmetic: Group Practice

```
x = "My favorite number is "
y = 5
print(x + y)

z = x + y
print(z)
```

```
Traceback (most recent call last):
  File "/home/ubuntu/workspace/variables.py", line 5, in <module>
    print(x + y)
TypeError: Can't convert 'int' object to str implicitly
```

Conclusion: It’s NOT okay to add ints and strings!

Variables and Types: Individual Practice

- Work on In-class Exercises 2
- Ask for In-Class Challenge if you finish early

Python Explorer Game

```
current_location = 0
print("Welcome to the Python Explorer.")
print("You are standing in a dark, shadowy tunnel. At your back is the south wall.")
print("To walk around, type N to move north and S to move south.")
print("When you find objects, try commands like look and open. Be creative!")
print("Use the command 'look around' to look up and down the tunnel")
print("Good luck!!")
```

```
Welcome to the Python Explorer.
You are standing in a dark, shadowy tunnel. At your back is the south wall.
To walk around, type N to move north and S to move south.
When you find objects, try commands like look and open. Be creative!
Use the command 'look around' to look up and down the tunnel
Good luck!!
```

Recap

- Variables can be used to store data
- Variable names have rules and conventions we follow
- Data can be of type integer, float, or string