UCLA TeachLA

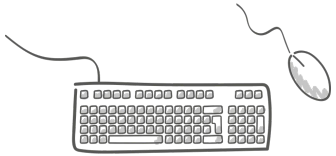
Variables

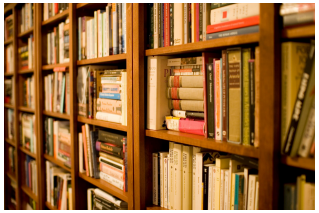
Agenda

- What is a variable
- Types of variables & how to use them
- Practice!

Your computer can do 4 things:

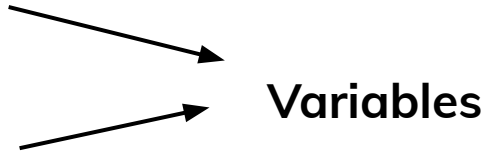
- **Input** (keyboard, camera)
- **Storage** (saving and reading information)
- **Processing** (do math to things)
- **Output** (video, audio output)



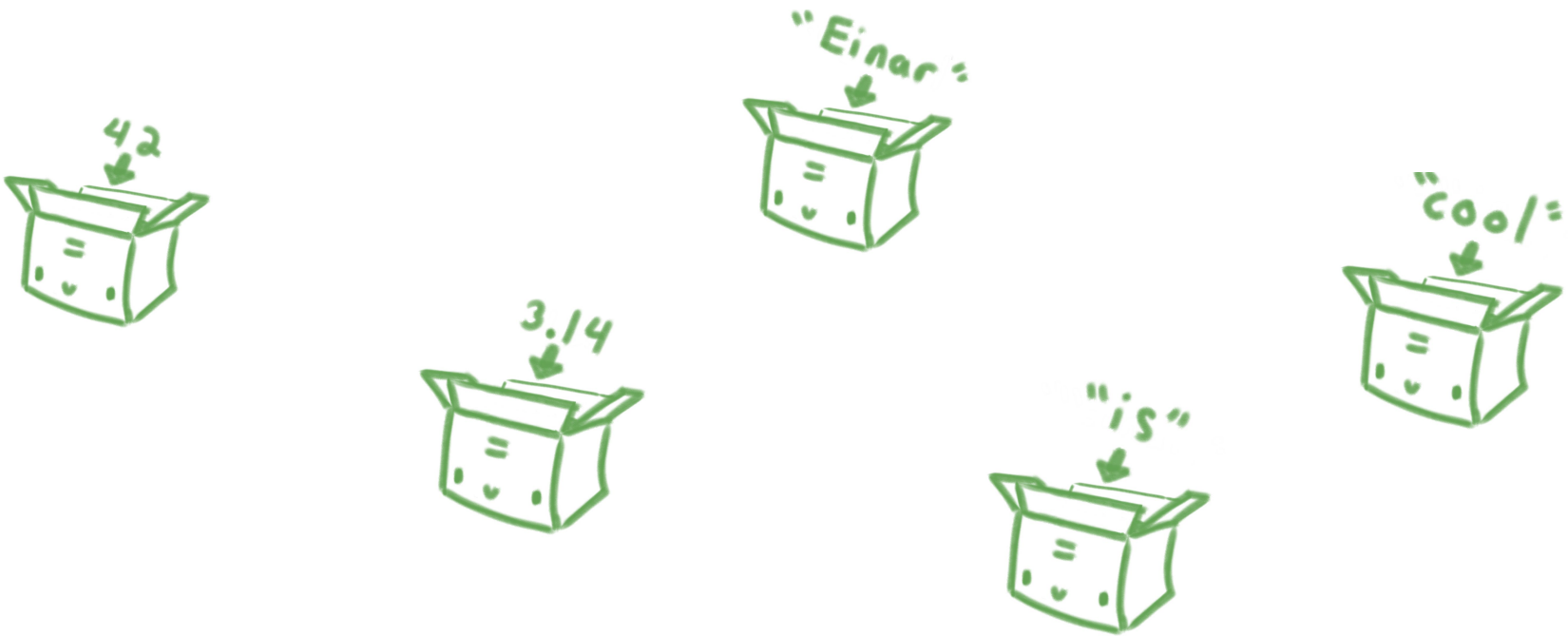


Today we will learn how Python can do processing *and* storage:

- **Input** (keyboard, camera)
- **Storage** (saving and reading information)
- **Processing** (do math to things)
- **Output** (video, audio output)



What are Variables?



Storing Variables

ALLOWED variable names:

x =

_var1 =

Var123 =

python_is_cool =

Storing Variables

NOT ALLOWED variable names:

python is cool =

var-1 =

1x =

print =

Storing Variables

Python is case sensitive:

ABE =

Abe =

abe =

Are all different variables!

Int Variables

main.py

Run

Shell

```
1  # Int variables....
2  # Store (int) data types
3
4  x = 4
5  print(x)
6
7  x = x + 4
8  print(x)
9
10 x = 12
11 print (x)
```

```
4
8
12
```

Int Variables

main.py

Run

Shell

```
1  # More (int) variable operations (shorthand)....
2
3  x = 10
4  print(x)
5
6  x += 15
7  print(x)
8
9  x -= 25
10 print(x)
```

```
10
25
0
```

Float Variables

main.py

Run

Shell

```
1  # Float variables....
2  # Store (float) data types
3
4  x = 2.3
5  print(x)
6
7  x = x + 3.5
8  print (x)
9
10 x = 10.0
11 print (x)
```

```
2.3
5.8
10.0
```

Float Variables

main.py

Run

Shell

```
1  # More (float) variable operations (shorthand)....
2
3  x = 2.2
4  print(x)
5
6  x *= 2.5
7  print(x)
8
9  x /= 1.1
10 print(x)
```

```
2.2
5.5
5.0
```

String Variables

main.py | Run | Shell

```
1  # String variables...
2  # Store (str) data type
3
4  x = "python"
5  print(x)
6
7  x = x + " is" + " cool"
8  print(x)
9
10 x = "acm"
11 print(x*3)
12 print("acm "*3)
```

```
python
python is cool
acmacmacm
acm acm acm
```

String Variables

main.py

Run

Shell

```
1  # More (str) variable operations (shorthand)...
2
3  x = "teach"
4  print(x)
5
6  x += "la"
7  print(x)
8
9  x *= 3
10 print(x)
```

```
teach
teachla
teachlateachlateachla
```

String Variables

main.py

Run

Shell

```
1  # # Can you do opeartions...
2  # With different variable types?
3
4  x = 4
5  y = 5.5
6  z = "python"
7
8  print(x+y)
9
10 print(str(x)+ " " + z)
11
12 print(y+z)
13
14
```

```
9.5

4 python

Traceback (most recent call last):
  File "<string>", line 12, in <module>
TypeError: unsupported operand type(s) for +: 'float' and 'str'
```

Why Variables?

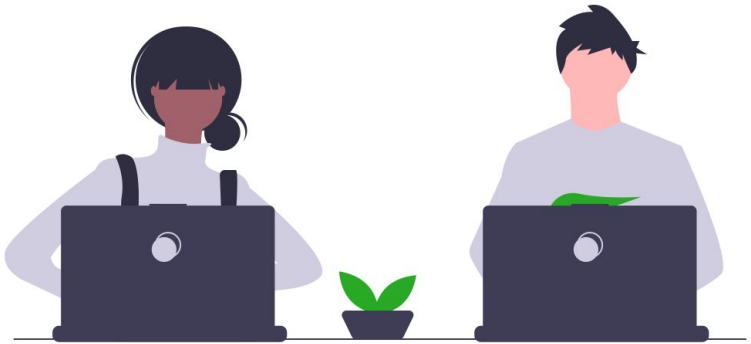
Make it easier to repeatedly use information

Stored in memory for easy access

Can be changed only in one place to use multiple times

Names tell you what value is being stored

Now it’s your turn!



Taqueria Problem

You are the owner of a local taqueria.

You need to create a menu.

1. Create a variable called **bean**. Set it equal to 2.
2. Create a variable called **cheese**. Set it equal to 3.
3. Now create a variable called **burrito**. Set it equal to the sum of **bean** and **cheese**. tt

Taqueria Problem

Your customers want chicken in their burritos.

1. Create a variable called **chicken**.

   Set it equal to 6.25 divided by 2.

Taqueria Problem

You have decided to also add a taco to the menu.

1. Create a **taco** item and set it equal to the remainder of **burrito** divided by 3. (*Hint: modulus*)
2. Create a **minitaco** item and set it equal to **bean** to the third power. (*Hint: exponent*)

Taqueria Problem

Time to print your menu!!

1. Using the *print* command, make your output print...

Taqueria Problem

Output

> The price of a burrito is (burrito price)

> The price of a taco is (taco price)

> The price of a mini-taco is (mini-taco price)

> Add ons - Chicken - (chicken price)

> The price of 10 mini-tacos is (10 mini-taco price)

Taqueria Solution

main.py

Run

```
1  bean = 2
2  cheese = 3
3  burrito = bean + cheese
4  chicken = 6.25/2
5  taco = burrito % 3
6  minitaco = bean**3
7
8  print("The price of a burrito is " + str(burrito))
9  print("The price of a taco is " + str(taco))
10 print("The price of a mini-taco is " + str(minitaco))
11 print("Add ons - Chicken - " + str(chicken))
12 print("The price of 10 mini-tacos is " + str(minitaco*10))
```

Shell

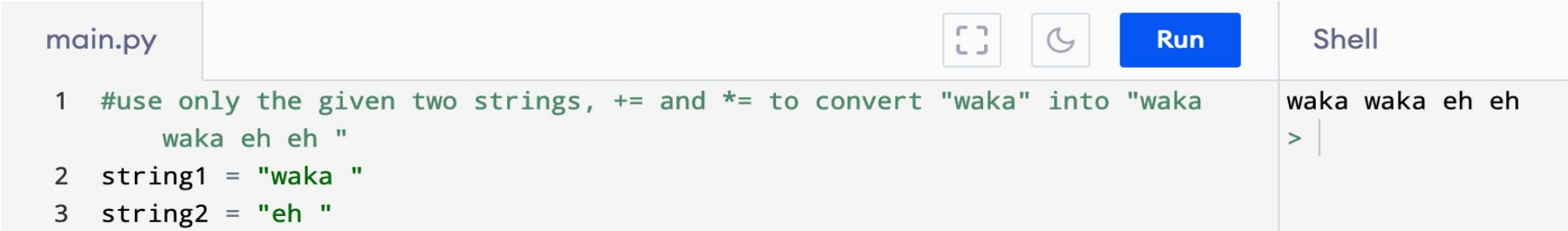
```
The price of a burrito is 5
The price of a taco is 2
The price of a mini-taco is 8
Add ons - Chicken - 3.125
The price of 10 mini-tacos is 80
>
```

Strings Problem

Print “Hi (name), you are (age) years old”

Strings Problem

Given two strings “waka ” and “eh ” convert one to “ waka waka eh eh ” using += and *=



What if there was no space at the end of “waka ” and “eh ”?

Strings Problem

Given two strings “waka ” and “eh ” convert one to “ waka waka eh eh ” using += and *=

main.py

Run

Shell

```
#use only the given two strings, += and *= to convert "waka" into "waka waka eh eh "
string1 = "waka "
string2 = "eh "
string1 *= 2
string2 *= 2

string1 += string2
print(string1)
```

```
waka waka eh eh
>
```

What if there was no space at the end of “waka ” and “eh ”?

Advanced Problem

Pythagorean Theorem - Find the Hypotenuse of a Right Angled Triangle given the other two sides

main.py

Run

Shell

```
# given sides side1 and side2 are 3 and 4
side1 = 3
side2 = 4
hypotenuse = (side1**2 + side2**2)**(1/2)
print(hypotenuse)
```

```
5.0
>
```

Advanced Problem

Quadratic Formula - Use the Quadratic Formula to solve x^2-3x+2

main.py

Run

Shell

```
1  # x^2 - 3x + 2
2  a = 1
3  b = -3
4  c = 2
5  determinant = b**2 - 4*a*c
6  solution1 = (-1*b + (determinant**(1/2))) / 2*a
7  solution2 = (-1*b - (determinant**(1/2))) / 2*a
8  print(solution1)
9  print(solution2)
```

```
2.0
1.0
>
```

Happy coding!