CIS 122

Storing things away
Recap

● Types
  ○ Integers
  ○ Floats
  ○ Strings

● IDLE
  ○ Type into the shell
  ○ Python responds immediately
Nothing lasts forever

- So far, everything is temporary
  - Expressions are evaluated once
  - Statements are executed once

- Why might we want permanence?
Nothing lasts forever

- So far, everything is temporary
  - Expressions are evaluated once
  - Statements are executed once

- Why might we want permanence?
  - We might not get a problem right the first time
  - We might want to solve a similar problem
  - We might want to solve a problem in pieces

- We would like to store things
  - Values (ints, strings)
  - Code
Or does it...

● We can store values in variables
  ○ Similar to algebra
  ○ Variables store data until we need it

● Remember this code?

```python
centimeters = 7
ratio = 0.4
inches = centimeters * ratio
```
Your first assignment

- To create a variable, you must assign it some value

- Use the assignment operator: ":="
  - NOT the same as in algebra
  - Assigns the value on the right to the variable on the left
Anatomy of an Assignment

Left Hand Side (LHS) Variable Name

Assignment Operator

Right Hand Side (RHS) Value

myNumber = 7
Anatomy of an Assignment

● What can go on the left?
  ○ Valid variable names
  ○ Contain letters, numbers, or underscores ( _ )
  ○ Must start with a letter or underscore

● These are valid:
  ○ cow
  ○ myVariable
  ○ this_is_an_unwieldy_variable_name_12

● These are not:
  ○ 12cow
  ○ cats&dogs
Anatomy of an Assignment

● Variable names are case sensitive

● These are all different variables
  ○ cow
  ○ Cow
  ○ COW

● If you define cow, but try to use Cow, python will be confused
  ○ NameError: name 'Cow' is not defined
Anatomy of an Assignment

- What can go on the right?
  - Anything that can be evaluated to a value
  - Values
  - Expressions
  - Other variables

- These work:
  - 5
  - "Hello"
  - 4 + 2
  - myVariable (if we've defined myVariable previously)
  - myVariable + 2
Anatomy of an Assignment

- What if your assignment has variables on both sides?
  - myVariable = otherVariable

- The two variables mean different things!
  - The LHS is used for its name
  - The RHS is used for its value

- Take the value stored in otherVariable and give it to myVariable as well
  - Now both variables contain the same value
Variable Assignment - Pop Quiz

- \( x = 5 \)
- fruit = "banana"
- 3 = myVar
- Seven = 3+4
- song = "Happy " + "Birthday"
- "Quote" = Quote
Using Variables

centimeters = 7
ratio = 0.4
inches = centimeters * ratio
Which is better?

centimeters = 7
ratio = 0.4
inches = centimeters * ratio

x = 7
y = 0.4
z = 7 * 0.4
Which is better?

- Both programs do the same thing
  - But the left is much more readable

- Be clear
  - Code is meant for humans to read
  - Use descriptive variable names

```python
centimeters = 7
ratio = 0.4
inches = centimeters * ratio
x = 7
y = 0.4
z = 7 * 0.4
```
Storing Code

- We've seen how to store values using variables
- We can store programs too
  - Let's go to IDLE