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...

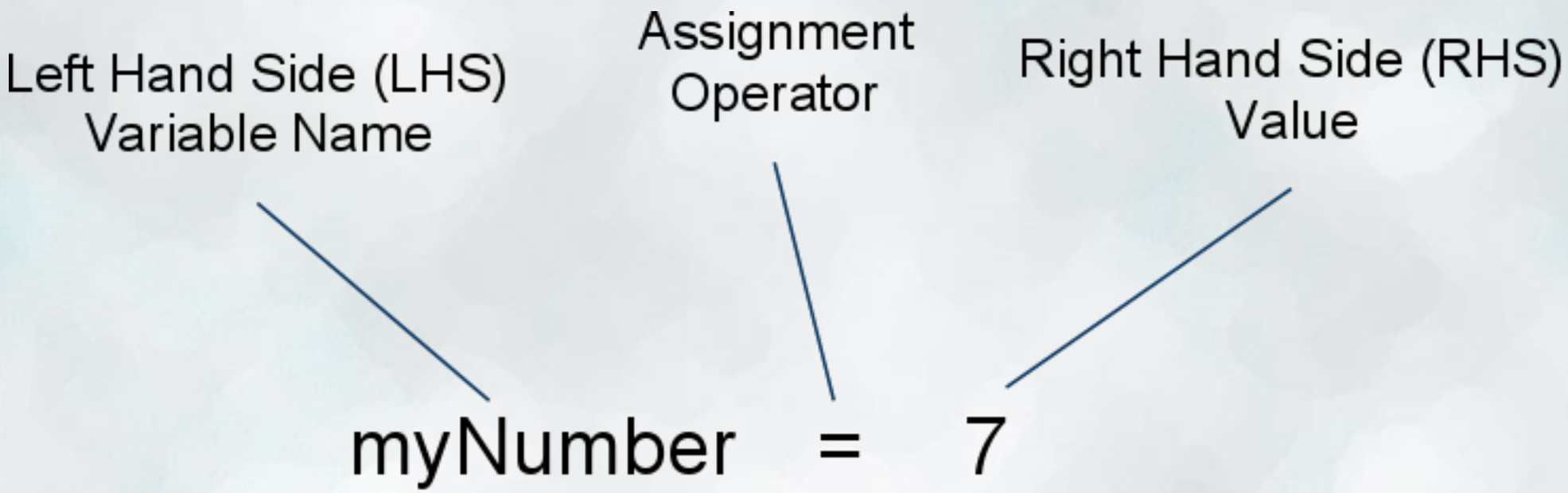
- We can store values in variables
  - Similar to algebra
  - Variables store data until we need it
- Remember this code?

```
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



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?

```
centimeters = 7
ratio = 0.4
inches = centimeters * ratio
```

```
x = 7
y = 0.4
z = 7 * 0.4
```

- 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

Storing Code

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