Creating and Assigning Variables

10/11/18

Journal

- What is a variable?
- What are some things in your life that change often?

- Students will manipulate and assign variables.
- Students will understand variables representing memory locations.
- Students will be able to use variables in Python.
- Students will write out the steps for a swap algorithm

CS Matters

Visualizing Variables

1. I need a volunteer.
2. You now represent a new variable! In order for a computer to know which variable is which, they need names . Variable names can be any sequence (beginning with a letter or underscore, and including no spaces), but usually we use words that describe what is inside the variable. (For example, if I have a variable for "student's age," I'm not going to name it`tree`, because the word `tree` has no relevance to your age.) Label this variable `team1` because we're talking about sports teams. You have now become `team1`, and should not respond to any other names!

Teams are ranked
#1. KC Chiefs
#2. LA Chargers
#3. Denver Broncos
#4. Oakland Raiders

Are these in the right order?

CS Matters

Initialize the variable

number1= "KC Chiefs"

1. A*ssign* a value to the variable. `team1 = “KC Chiefs"`
2. = means assignment
    a. Will KC Chiefs always be team #1?
    b. Will the top ranked team always be team #1?
3. Write “KC Chiefs” on a notecard and put it into the cup.
4. What is the type of “KC Chiefs"?

Second variable

number1 = number2

1. Next, we need to *initialize* our second variable and *assign* a value to it.
2. I need another volunteer.
3. We will follow the same process as `team1` and “KC Chiefs", this time using `team2` and “LA Chargers".
4. We’ve now *initialized* our two variables, but what will happen if the Chargers win the next few games and the Chiefs are no longer undefeated? We have to model a *swap* in our code to reflect this change and fix our scoreboard.

swap →

```
temp = number1
number1 = number2
number2 = temp
```

Think-Pair-Share

1. A value is only safe (and not lost to the world of cyberspace) if it is in a variable. A variable can only hold one value at a time. How can we swap values between `team1` and `team2`?
2. Direct `team1` and `team2` to swap their values. Key point: when we access a variable and put its value in the place of another variable, that value is being copied. By doing so, however, any previous value in the variable is lost.

But, Python is special

- It has a special "shortcut syntax" that allows a swap in one step

```
a,b = b,a
```

a, b, c = c, a, b ?

test it?

- Why would the writers of python do this?

Brain Break

Comparison, Logical Operators and Conditions

Objectives:

1.2.2 - Create a computational artifact using computing tools and techniques to solve a problem.

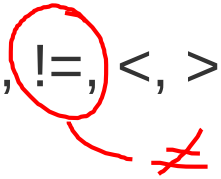
5.1.2 - Develop a correct program to solve problems.

5.4.1 - Evaluate the correctness of a program.

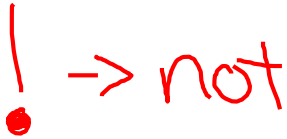
5.5.1 - Employ appropriate mathematical and logical concepts in programming.

Comparison Operators

==, !=, <, >, >=, <=



what are they?



Logical Operators

Includes AND, OR, and NOT

Try some in your Python IDE

Activity: What's in the Box?

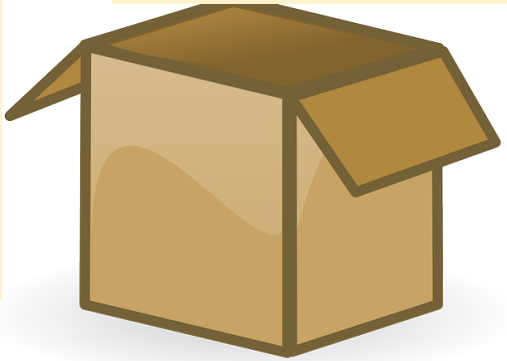
A	B
7	11

Pseudocode

```
if numofA > numofB:
    open A box
else:
    open B box
```

Activity Directions:

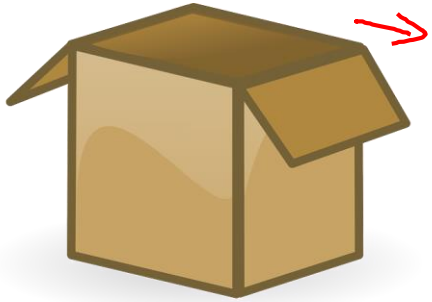
1. Record votes for color preference.
2. Use pseudocode to determine which box to open
3. Open the box and display the item



CS Matters

Activity: What's in the Box? Verson 2

A	B	C
3	5	10



Pseudocode

```
if numofA > numofB:
    open A box
elif
    open B box
else
    open C box
```

Activity Directions:

1. Record votes for color preference.
2. Use pseudocode to determine which box to open
3. Open the box and display the item

Write the PsuedoCode to determine if you should say a number (and which)

amt Of Robots

Matters

Runestone Sections (continued from lesson 06)

Simple Python Data

Variables, Expressions and Statements

Values and Data Types

Type conversion functions

Variables

Variable Names and Keywords

Statements and Expressions

Operators and Operands

Input

Order of Operations

Reassignment

Updating Variables