Homework

- First assignment due tomorrow night.
- Convert Fahrenheit to Celsius (the given program converts Celsius to Fahrenheit).
- Submit as attachment.
- Let's look at the given program, and describe it using computer science jargon.

Running IDLE

- From START menu, pick “all programs”, then Python 3.2
- Pick the “IDLE” option

IDLE

- IDLE is an interpreter.
- Responds to input line-by-line.
- IDLE prints the value of an expression.
- To write a whole program instead of single lines, we use the script window.
- A script is a program that is run by an interpreter.
- The other option is a compiler – translating the program into machine-readable form and actually running it are two separate steps.

Making a program

- Do something more complicated
- Remember and repeat a bunch of commands

Programming jargon

```python
print("Take me to your leader")
```

- This is a statement.
- print is a function.
  - Does some computation
- Recognize a function by parentheses.
- “Take me to your leader” is a string.
- “9/7” would also be a string.
**Strings in English**

Dick said, "See what Mike and I have. This is Puff with me. That is Spot with Mike."

**Expressions**

\[ \text{print}(4+5) \]

- \(4+5\) is an arithmetic expression.
- It's value is 9.
- 4, 5 and 9 are integers.
- + is an operator.

- Does computation, like a function. The only reason there are two ways to do computation is that it is more human-readable.

**Variables**

```python
>>> x = 2
>>> x = x+3
>>> print(x)
5
```

- **x** is a variable
- "x = 2" is an assignment statement
- Variable on left-hand side gets value on right-hand side.
- Pronounce this "x gets 2" or "x becomes 2"
- Value of x is now 2

**Variables**

- Think of a variable as a box.

```python
>>> x = 2
```

- The name x is the label on the box.

**Variables in computer's memory**

```python
x = 2
```

- A assignment statement stores data (in this case, the number 2) in the computer’s memory
- The program uses the variable name to refer to the particular location in memory where the data is stored (the label on the box where it put it).
### Floating point numbers
- 7.0, 2.0, 0.0006, 7.34 – floating point numbers
- 7/2 produces the floating point value 3.5
- 6/3 produces the floating point value 2.0
- If either number is floating point, so is the answer – so 7.0 + 3 produces the floating point value 10.0.

### Floating point is not exact
- >>> 8.0/3.0
- 2.6666666666666665
- This is weird…why?
- Computer numbers have a fixed number of decimal places
- Exact results with floating point numbers would have an infinite number of decimal places:
  Example: 8.0/3.0 has the value 2.666666……

### Data types
- Strings, integers and floating point numbers are different data types in Python
- You can store any data type in a variable.

### The user
The person running the program.

### Getting input
```python
celsius = input("Enter temperature in celsius: ")
```
- The input function asks the user for a data value.
- The data type of the variable on the left is always string.
- We say the input function returns a string.

### ECS 10 Commenting Rules
- When you first introduce a variable, add a comment
  - What data type is it [integer, string, floating point]?
  - What is it supposed to contain? What does the data mean?
Tomorrow’s assignment

- Does not need to get user input.
- Does not need to comment every variable.
- You can if you want to get a move on… which is a good idea!