Intro to Python: Class 2 Outline

1) Variables
   - A variable name is a symbolic name linked to a memory address containing a value
   - Every value in Python has an implicit data type
   - Refer to python_variables_types.jpg in: https://github.com/skoshiwosh/cgpython
   - These are standard data types: numbers, boolean, string, list, tuple, dictionary
   - Some other types that will not be addressed in class are: set, bytearray, complex, etc
   - Python allows variable name to be re-assigned to data of different type. This is called dynamic typing and will be explained further

2) Variable Name Syntax and Standards
   - Must begin with letter or underscore
   - Other characters after beginning can be letters, numbers and underscores
   - Names are case sensitive
   - Names should begin with a lower-case letter unless it's a class name. In that case, the name should begin with upper-cass
   - Don't use double underscore in start and end of a name
   - Can use single underscore to denote a private class method
   - Prefer to separate word pieces in a variable name with underscore, but camelcase is also common
   - Examples:
     - foo_bar
     - fooBar
     - foobar
   - Other common standards:
     - I, j, k denote integers
     - x, y, z denote floats
   - Avoid using I because it might look like 1 or O because it might look like 0

3) Expressions using integers, floats and booleans
   - +, -
   - *, **, /
   - //, %
   - <<, >>
   - & , |, ^, ~
   - <, >, <=, >=, ==, !=
   - not, and, or
   - Shortcut for math operation and assignment: a = a * 3 ---> a *= 3
   - Review these docs on github: https://github.com/skoshiwosh/cgpython intfloatbool_expressions.pdf, python_expressions.pdf

4) Evaluation Order
- Use parentheses to control order of evaluation
- Look at exp_eval_order.pdf in https://github.com/skoshiwosh/cgpython

5) Review keywords and built-in functions
- Look at pykeywords.pdf and pybuiltinfuncs.pdf in: https://github.com/skoshiwosh/cgpython
- Give examples of the following functions: *print*, *input, type, int, float and others*

6) Code Blocks and Indentation
- Python uses indentation to mark blocks of code. Other programming languages such as C++ use curly-brackets for code block designation
- Code blocks affect flow of execution and scope of variables. Bugs will occur if indentations are inconsistent. These types of bugs can be the most difficult to solve. This is why the top most Python standard is to use a 4-space soft tab in all Python scripts. Refer to pystandards.png in: https://github.com/skoshiwosh/cgpython
- *Comments* are any text to the right of the # symbol and is mainly useful as notes for the reader of the program.

7) Sequence Types: Strings, Lists, and Tuples
- Define *object*
- Define mutable vs immutable
- Refer to ex_mutable_immutable.pdf in: https://github.com/skoshiwosh/democode
- Strings are a sequence of characters enclosed in double or single quotes.
- Strings are formatted using f-string, format method or % syntax
- Use triple quotes to define a multi-line string.
- A string object is immutable and cannot be changed in place.
- Review builtin string methods: str.endswith, str.find, str.format, str.index, str.join, str.lower, str.replace, str.split, str.startswith, str.strip, str.upper
- Review list_methods.pdf and string_operations.pdf in: https://github.com/skoshiwosh/cgpython
- A list is an ordered sequence of objects of any type.
- A list is mutable and can be changed in place.
- A tuple is like a list but it is immutable.