BNFO 135: Programming For Bioinformatics

Variables, Expressions, and Statements

Lecture 2

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Values and Types

- Examples of values:
  - 1 – an integer
  - 2.3 – a float
  - 'hello' – a string

- To determine the type of a value use the 'type' function
Variables

• A variable is a name that refers to a value

• An assignment statement creates a new variable and gives assigns it a value

  >>> msg = 'hello, world!'
  >>> n = 17
  >>> pi = 3.14
Variables

- The type of a variable is the type of the value it refers to

  >>> type(msg)
  <type 'str'>

  >>> type(n)
  <type 'int'>

  >>> type(pi)
  <type 'float'>
Variable Names

- We like to choose meaningful names for our variables
- They can contain letters and numbers, but must begin with a letter
Keywords

- Python has 31 keywords that cannot be used as variable names

- Keywords tell the interpreter that to look out for a special program construct

- 'if', 'else', 'while', 'for', 'class', 'in', and 'and' are some keywords
Operators and Operands

- Operators are special symbols that represent computations

- The values the operator is applied to are called operands
Expressions and Statements

- An expression is a combination of values, variables, and operators

- A statement is a unit of code that the Python interpreter can execute

- An expression can be evaluated to a value, a statement cannot
Interactive and Script Modes

- In interactive mode the interpreter displays the result of expressions, because they have a value.

- In script mode the interpreter will not display the result of an expression, unless you 'print' it.
Order of Operations

• When more than one operator appears in an expression the order of evaluation depends on precedence rules

• For mathematical operators the acronym PEMDAS can be used to remember the rules
String operations

● Concatenation
  ● The '+' operator on strings joins them together

● Repetition
  ● The '*' operator on a string and an integer, n, creates a string with n repetitions of the string
Comments

- As our programs get more complicated, they get more difficult to read

- This is why we should add notes to our program to explain what we are trying to accomplish

- Comments begin with the '#' symbol
Debugging

- At this point the most common error you might make is an illegal variable name

- Be careful to define all of your variables before using them

- Variable names are case sensitive