Intro to Python

Why Python?

- Easier to learn than many languages
  - Easy to read
  - "Intuitive" syntax
- Free
- Can be used on Mac, Windows, Unix/Linux
- Well documented
- Used across disciplines - including scientific applications

Exercises: Math and Types

1. Calculate the mean of the numbers 2, 3, and 10.

2. Calculate the hypotenuse of a right triangle with sides 6 and 8.

3. Try multiplying each type by 2, what does multiplication mean for an int, float, str, and bool? Do you notice different behavior if 2 is a float or and int? Test addition, subtraction, and division. Can you add and subtract strings? What about Booleans?

Exercises: Lists

1. Make a list with 5 things in it.

2. Print the 4th thing in the list.

3. Print the sublist containing the 3rd, 4th, and 5th things in the list.

4. Experiment with multiplication and addition on a list. What do these operations do?

Exercise: Dictionary

1. Make a dictionary and experiment using different types as keys. Can containers be keys? Why or why not?

Exercise: if, elif, else

1. Write an if statement that prints whether x is even or odd

Exercises: Plotting

1. Create a plot with at least 5 points. Make your points circles with a dashed line connecting them.

2. Zoom in on a point on your plot. Notice what happens to the x and y axis tick labels. Do your points get any bigger?

Exercises: For loop

1. Using a loop, find the mean of [3, 4, 5, 2, 8, 10, 14, 16, 29]

2. Using a loop, plot y = x**2 for x between 0 and 10

Exercise: Functions (part 1)

1. Using your last exercise, create a function which calculates the mean of an input list of numbers

Exercises: Reading text files

1. Read the file 'big_animals.txt' and print each line on which more than 10 moose were sighted.

2. Turn the code for #1 into a function and use it on the files 'merida_animals.txt' and 'fergus_animals.txt'.

Exercise: Functions (part 2)

1. Add a function to circle which calculates the circumference of a circle

2. import math to your function file and replace 3.14 with math.pi

3. Create a text file with a list of numbers separated by commas (all on one line)

4. Use what you've just learned and the mean function you wrote previously to write a program which takes the name of a test file as input, reads a list of numbers from the file, and prints the mean of the list of numbers