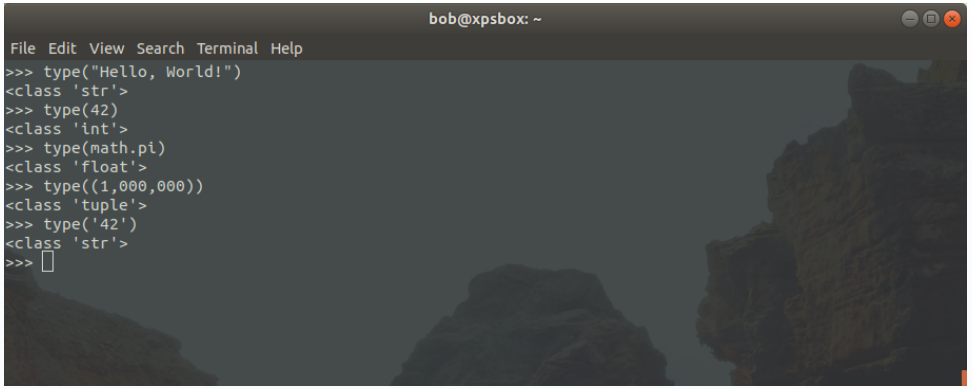
EGM722 – Programming for GIS and Remote Sensing

Week 1, Part 2: Built-in types

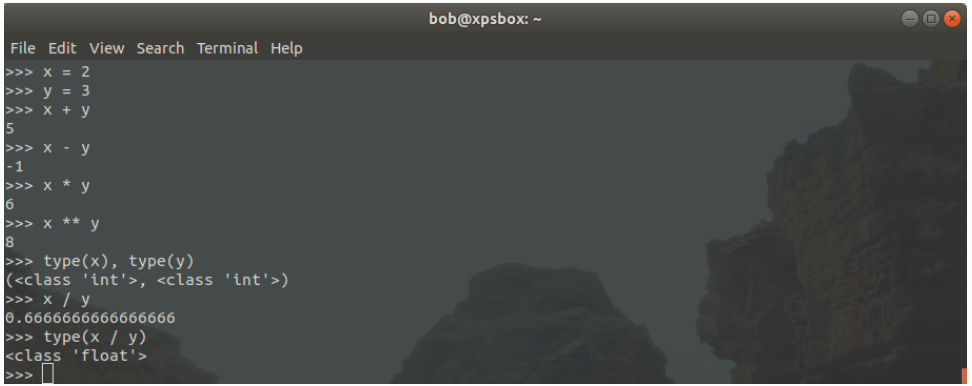
Recall: The world is filled with objects

- Python is an object-oriented programming language
- Object: the basic “thing” that python works with
- Objects have:
  - type
  - properties
  - methods



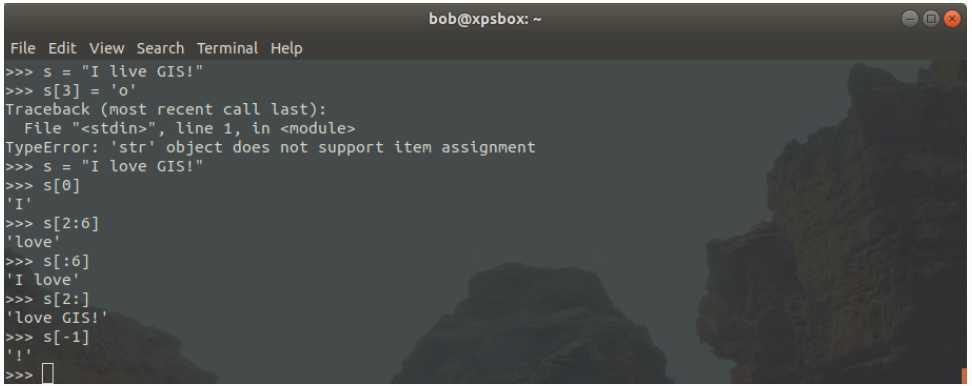
Numbers

- Python has three main numeric types:
  - integers
  - floating-point (decimal) numbers
  - complex numbers
- When combining types, result uses the ‘wider’ definition
  - e.g., int + float => float
  - float + complex => complex



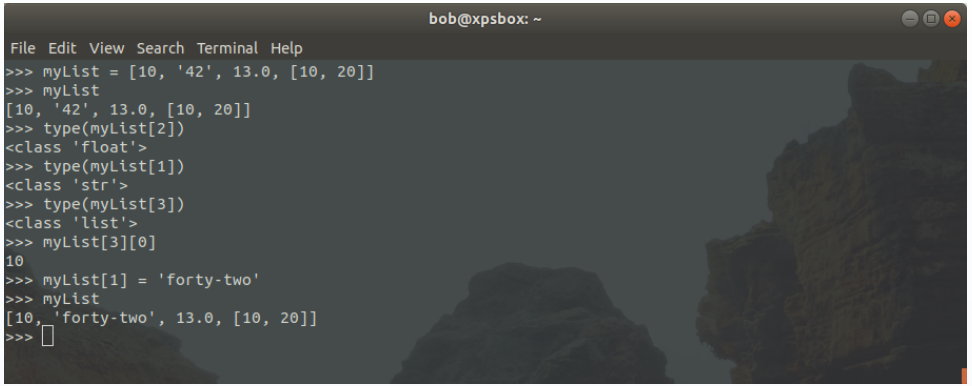
Strings

- Python handles text as strings
- Strings are immutable arrays of text characters
  - Cannot modify/change elements
- Individual characters are located at an index
  - NB: in python, arrays start from 0
- To access multiple indices, can slice: s[n:m]
  - If we omit n, starts from beginning
  - If we omit m, goes to end
  - Can also use negative numbers



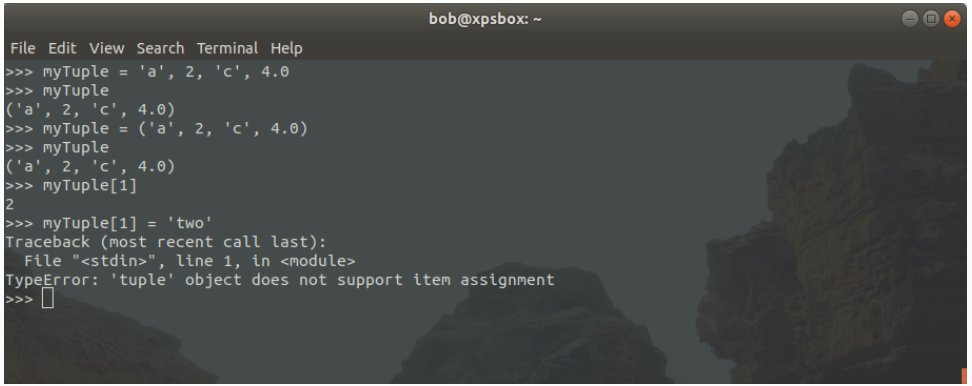
Lists

- A list is a sequence of values called elements or items
- Can create with [ ], list()
- Elements can be any type
  - Can also be mixed types
  - Can be nested (a list of lists)
- lists are mutable



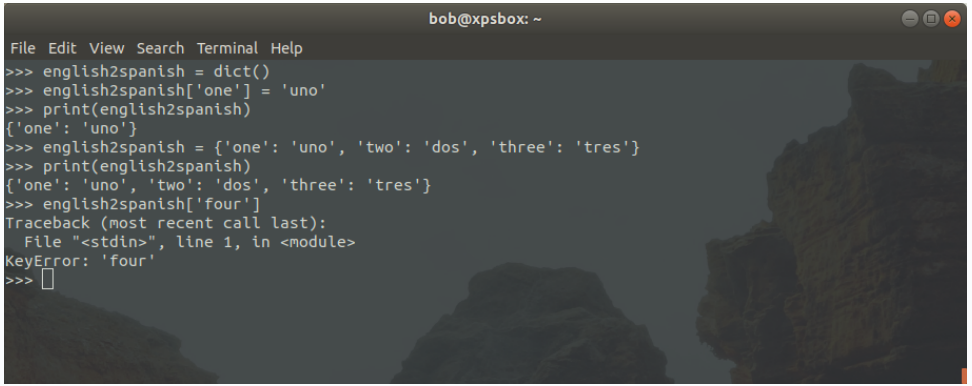
Tuples

- tuples work like lists:
  - Can contain multiple types
  - Index using [ ]
  - Can be nested
- Create with commas, ( )
- Tuples are immutable



Dictionaries

- A dictionary is like a list, but more general
  - List indices: integers
  - Dictionary indices: almost anything
- Create using dict(), { }
- Dictionaries map indices (keys) to values: key-value pair



Summary

- Python has a number of built-in types that we can use
- Most common (for now) are numbers and sequences
- Sequences can be indexed, sliced to access smaller parts of the whole
- Lists can be changed; strings and tuples cannot