Why Python

* The coding language we'll be using in this course is Python.
  + Python is a free, object-oriented programming language used in a variety of development contexts. Its focus is on being "friendly," meaning it simplifies syntax and makes use of white space to promote code readability.
  + Python is also open source, which means that it's free and continues to evolve as people contribute directly to its main code repository.
* Industry Context
  + So where is Python used? Python can be found in a wide variety of contexts: tools, process automation, mathematical calculations, data visualization, website creation, and more!
  + Python is frequently ranked as one of the most popular coding languages, in large part because of its versatility. Because of its open-source nature, developers are able to create libraries that apply Python to contexts including:
    - Statistical analysis (scikit-learn, StatsModels).
    - Web design (Django, Flask).
    - Software development (ArcGIS and Maya software both incorporate custom Python code, while computer games like Civilization IV were built on Python frameworks).
* Python and Data Science
  + Even if we narrow our focus to data science, it’s difficult to encapsulate the breadth of Python’s applications. Python is used to collect data from sources like databases and APIs, clean and organize the data, then build, tune, and evaluate machine learning models.
  + Python has many libraries to assist with these types of functions, including:
    - [Pandas](http://pandas.pydata.org/): A library that allows for the cleaning, organization, and structuring of data. Think of this as a souped-up Excel for use within Python.
    - [SciKit-Learn](http://scikit-learn.org/stable/): Includes a wide variety of statistical and machine learning models, allowing data scientists to try multiple models on their data sets without the time commitment of building them independently.
    - [TensorFlow](https://www.tensorflow.org/): Is growing in popularity as neural networks become more widespread and broadly used. There are increasingly few areas of coding in which Python would not be a valid choice as the chief programming language.
    - [NumPy](http://www.numpy.org/) and [StatsModels](http://www.statsmodels.org/stable/index.html): Allows for advanced mathematical calculations and statistical analysis.
  + With so many functions readily available in these easy to use libraries, it's no wonder that nearly every industry uses Python code in some capacity!