Python for Machine Learning

Summer & Fall 2020

# Instructor Information

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| Instructor | Email | Office Hours |
| Keenan M. | keenan@thepythonacademy.com | MWF – 8 to 8:30 pm, after class on Google Hangouts |

# General Information

## Description

This Course, Python for Machine Learning, represents the final stage to helping you achieve the Black Belt Certification.  This course will teach you how to create advanced models with Python, including:

* Support Vector Machine for Classification
* Neural Networks and Deep Neural Networks with Keras and Tensorflow
* Recommender Systems
* Natural Language Processing
* Unsupervised Learning with K means Clustering

## Expectations and Goals

By the end of this class, you will able to create Deep Neural Networks to predict outcomes, along with variants of neural networks such as CNNs and RNNs.

We expect you to attend class, pay attention, and do your homework. If you don’t do your homework or code along in class, you will fall behind and get frustrated. In return, we promise you to give you 100% effort on giving you the most up-to-date material and experience you will need to be successful in the data science field.

# Course Materials

## Required Materials

* You will need to have your own laptop or desktop (we only support troubleshooting for Windows, our staff has limited knowledge of MACs)
* You will receive a free copy of the “Introduction to statistical learning” by Gareth James, freely available on the USC website.

# Course Schedule (next page)

**Week 1**

The following topics are covered in this class. All topics are covered with real life examples and applications of the topic. Homework is always given after the class and reviewed at the beginning of the next class.

* Introduction to Deep Learning
  + Perceptron model
  + Activation functions
  + Backward propagation
  + Cost functions and gradient descents
* Review of machine learning statistics
  + Matrix multiplication
* Artificial Neural Network with Tensorflow

**Week 2**

The following topics are covered in this class. All topics are covered with real life examples and applications of the topic. Homework is always given after the class and checked at the beginning of the next class.

* Data Preparation
* Creating training of the model
* Model Evaluation
* Exploratory data analysis
* EDA and preprocessing

**Week 3**

The following topics are covered in this class. All topics are covered with real life examples and applications of the topic. Homework is always given after the class and checked at the beginning of the next class.

* Classification
* Dealing with overfitting
* Multi-class problems
* Natural Language Processing