Thomas Weis
Private Lesson Advanced Topics
AI & Machine Learning Concepts

Here's the list of things the two of us have worked on together over the course of the last year:

1. Pandas:
   - Tabular Data
   - Linear Regression Model with Pandas
   - Mean Squared Error and its application in linear regression
   - Cleaning up HTML conversion
   - Fitting data on a DataFrame
   - Importing top search results
   - Extracting data
   - Manipulating test size
   - Reviewing previous code errors
   - Updating and resolving errors
   - Reshaping datasets
   - Plotting images
   - Exploring datatypes
   - Exploring lambda functions
   - Extracting HTML for model use
   - Excluding unreliable sites
   - Changed notation to represent heads of data in graphical models

2. NumPy:
   - Creating scatter plots
   - Vectorizations for programming techniques
   - Complex functions for the stock market
   - Used different operations to view different rows and columns in matrices

3. Machine Learning Concepts:
   - Neural Networks
   - Convolutional Neural Network (CNN) concepts
   - Densely connected neural networks
   - KNN models
   - Grid search with KNN models
   - Linear Regression Model
   - Error analysis
   - TFIDF algorithm
   - PassiveAgressiveClassifier algorithm
   - Reviewing "PassiveAgressiveClassifier" algorithm
   - Reviewing printing shapes of testing objects
   - Test size manipulation
   - Reviewing previous code errors
   - Updated and resolved all errors
   - Generating general model summary

- Ran model using different activation functions (ReLU, Softmax, Sigmoid, and Hyperbolic Tangent)

4. Data Processing and Manipulation:
- Vectorizing strings into integers
- Converting strings into arrays
- Creating frequency tables of arrays
- Found cosine similarity based on frequency tables
- Implementing code to compare two sets of data
- Looked into the urllib2 library
- Moving urllib2 data into similarity analysis

5. Deep Learning:
- Layers and Padding
- 2D vs 3D convolutional layers
- Reviewed pooling layers
- Reviewed dropout layers
- Reviewed flattening layers
- Difference between ReLU and Sigmoid functions
- Ran model using different activation functions (ReLU, Softmax, Sigmoid, and Hyperbolic Tangent)
- Explored CV2 and dlib libraries

6. Miscellaneous:
- Weighting different AI types' benefits
- Planning the steps of the project
- Extracting HTML for model use
- Implemented code to compare two sets of data
- Reviewed algorithms examining content, not just word similarities
- Writing to a text file
- Excluding unreliable sites
- Cosine similarities for comparing URLs found to an inputted URL