ML Day wise Curriculum

- **Day 1** : General Discussion & Installation of Anaconda, Exploring other IDEs.
- **Day 2** : Python fundamentals discussion & Programing basics like, variable, if-else, loop etc. Building up **Quiz Master App**.
- **Day 3** : Implementation of loops & some basic logic building programs. Creating a **Number Prediction Game**.
- **Day 4** : Discussion of Data Structures in Python. List, Tuple, Set, Dictionary & Implementations.
- **Day 5** : Functions, Packages & Modules, Magic Functions, Discussion of Python File Structure.
- **Day 6** : OOP Concepts in Python, Defining Class, Object, Constructor, Destructor etc.
- **Day 7** : Implementing Inheritance, Polymorphism. Discussion on Memory Management, Generators & Decorators.

- **Day 8** : Introduction to File Handling in Python. Text File handling APIs in Python. Building **Employee Data Manager Program** using File Handling.
- **Day 9** : Implementation of Binary File Handling in Python. Handling Web APIs and JSON Responses in Python. **Weather Application**.
- **Day 10** : IP Location Finder Program & Web Scrapping basics. Creating **Dictionary App** & **Webpage Image Downloader**.
- **Day 11** : Web Scrapping in depth. **Scrapping Wikipedia, Amazon, Flipkart** etc.
- **Day 12** : Introduction to Selenium. **Scrapping YouTube**, **Instagram** using Selenium.
- **Day 13** : GUI Development in Python using tkinter. Discussion of other UI development frameworks in python.
- **Day 14** : Creating WordArt in WordCloud module & Creating a full **WordArt Creation** application using tkinter.
- **Day 15** : Building **KeyLogger** and **ScreenCapture** Applications in Python, Discussion of **WebsiteBlocker** Application in Python.

- **Day 16** : Numpy Basics – 1. General Discussion of numpy arrays. Different Numpy Initializers. Comparing execution time of numpy arrays with python lists.
- **Day 17** : Numpy Basics – 2. Array slicing, broadcasting etc.
- **Day 18** : Introduction to OpenCV. Discussion of Images and Different Image Filters.
- **Day 19** : Affine Transformations for Images using OpenCV. Discussion of Kernel Matrix for Images.
- **Day 20** : Implementing different kernel transformation for images. Blur Kernel, Sharpen Kernel, Edge Detection Kernel etc. Applying different Image Filters using CV. Creating an **Image Manipulation Toolkit** in Python.
- **Day 21** : **Face Detection** & Video Capture Basics in OpenCV.
- **Day 22** : **Color Detection** with various process, **Motion Detection, Edge Detection** in Video Capture.
- **Day 23** : **Eye, Face, Nose, Smile Detections** using OpenCV **harcascades** in Video Frames.
- **Day 24** : Pandas basics – 1. Introduction to pandas for Data Manipulation. Discussions on Series, DataFrame, Panel and their various operations.

- **Day 25** : Pandas basics – 2. Merging , Joining of DataFrames. Different merging methods of DataFrames.
- **Day 26** : Matplotlib basics – 1. Discussion of different Plotting and Data Analyzing tools in matplotlib. Scatter Plot, Line Plot, Bar Plot, Image Plot etc.
- **Day 27** : General Discussion on Machine Learning. Supervised, Unsupervised, Semi-supervised Learning problems & algorithms.
- **Day 28** : Discussion on Machine Learning terms i.e. Cost/Loss Function, Learning Rate, Model, Features, Labels etc. Detailed Discussion on Data Preprocessing. Implementing Min-Max Scaler from sklearn.
- **Day 29** : In-depth discussion on Simple Linear Regression.
- **Day 30** : Discussion about Learning Algorithms. Implementing Gradient Descent in depth.
- **Day 31** : Ridge, Lasso, ElasticNet Regression discussion from sklearn. Discussing Regularizations, L2 and L1.
- **Day 32** : Discussion on Feature Transformation. Implementing Polynomial Regression.

- **Day 33** : Classification Problems. Sigmoid Function & Logistic Regression, Nearest Neighbor Algorithms. Implementation using **IRIS Flower dataset**.
- **Day 34** : Detailed discussion on Support Vector Machines. A project on **Digit Recognition Classifier**.
- **Day 35** : Naïve-Bayes Algorithm and implementation using **Fake News Classifier**.
- **Day 36** : An Introduction to Neural Network. Implementing Neural Nets as logic gates and performing vector operations.
- **Day 37** : Detailed discussion on CNN. Exploring the terms Convolution, Max-Pooling, Drop-outs, Dense Layer, Activation Function, Learning Rate, Batch, Epoch etc.
- **Day 38** : Building a LeNet 5 model using **MNIST dataset** in Keras (Major Deep Learning Project - 1).
- **Day 39** : Building a **Traffic Sign Classifier** model in Keras (Major Deep Learning Project - 2).
- **Day 40** : Part – 1 : An in-depth implementation of Nvidia Deep Net Model to a **Virtual Self-driving Car** (Major Deep Learning Project - 3).

- **Day 41** : Part – 2 : Final Part of Nvidia model in virtual self-driving car.
- **Day 42** : Evaluation Test on above topics.

Bonus : Building a Deep Learning model in tensorflow High Level API and discussion on tensor operations.

Note : We cover way more content than it is mentioned in this document considering the passion and performance of students in extra time.