Session Plan for ML and Deep Learning

Day 1 : Machine Learning

Session	Time	Topic
Session 1	9:00 am - 11:00 am	>Machine Learning Walkthrough:,Supervised Learning,Unsupervised Learning, Reinforcement Learning. > Building a Data Preprocessing template **Supervised Learning : *Regression Problem :*** >Linear Regression with One Variable : Model Representation,Cost Function. > Hands-on: Predicting Salary of employees based on their experiences using Python and Sklearn
Tea Break - (11:00 am - 11:15 am)		
Session 2	11:15 am - 1:15 pm	**Supervised Learning : *Regression Problem :*** > Linear Regression with Multiple Variables: Feature scaling and Learning rate. > Hands-on: 50_startups with different spends such as R&D, Marketing, Sales etc to predict the profit of the startup > Non linear Regression,Polynomial Regression > Hands-on: Predict salaries of employees based on position and level. > Support Vector Regression (SVR) Intuition > Hands-on: Predict salaries of employees based on position and level.
Lunch Break - (1:15 pm - 2:00 pm)		
Session 3	2:00 pm - 3:30 pm	**Supervised Learning : *Regression Problem :*** > Decision Tree Regression Intuition > Hands-on: Decision Tree Regression in Python > Random Forest Regression Intuition > Hands-on: Random Forest Regression in Python > Evaluating Regression Models Performance :R-Squared Intuition,Adjusted R-Squared Intuition
Tea Break - (3:30 am - 3:45 am)		
Session 4	3:45 pm - 5:00 pm	**Supervised Learning : Classification Problem:** > Logistic Regression Intuition > Hands-on: Logistic Regression in Python > K-Nearest Neighbor Intuition > Hands-on: K-Nearest Neighbor in Python > Naive Bayes Intuition > Hands-on: Naive Bayes in Python

Day 2 : Machine Learning

Session	Time	Topic
Session 1	9:00 am - 11:00 am	**Supervised Learning : Classification Problem:** > Evaluating Classification Models Performance : False Positives & False Negatives, Confusion Matrix > Evaluating Classification Models Performance : Accuracy Paradox, CAP Curve Analysis > Comparison of Different models of regression & Classification Problem and when to use which model.
Tea Break - (11:00 am - 11:15 am)		
Session 2	11:15 am - 1:15 pm	**Unsupervised Learning :** > Clustering walkthrough > K-Means Clustering Intuition > Hands-on: K-Means Clustering in Python > Hierarchical Clustering Intuition > Hands-on: Hierarchical Clustering in Python
Lunch Break - (1:15 pm - 2:00 pm)		
Session 3	2:00 pm - 3:30 pm	**Reinforcement Learning :** > Multi Armed Problem > Upper Confidence Bound (UCB) Intuition > Thomson Sampling > Hands-on: Thomson Sampling in Python
Tea Break - (3:30 am - 3:45 am)		
Session 4	3:45 pm - 5:00 pm	**Model Selection :** > K-fold cross validation > Grid search to find the best hyperparameters > Best Practises to follow > Q&A

Day 3 : Deep Learning using Keras

Session	Time	Topic
Session 1	9:00 am - 11:00 am	**Artificial Neural network :** > Deep Learning walkthrough > Artificial Neural Networks Intuition > Activation Function > How the neural network learns > Gradient Descent,Stochastic Gradient Descent > Understanding concept of Backpropagation in dept
Tea Break - (11:00 am - 11:15 am)		
Session 2	11:15 am - 1:15 pm	**Building Artificial Neural network (ANN): Hands-on** > Understand the business problem in hand : Churn Modelling Problem,Should we say goodbye to that customer ? > Get the dataset and necessary libraries needed > Understand keras in depth > Building the ANN step by step on jupyter notebook or colab or pycharm
Lunch Break - (1:15 pm - 2:00 pm)		
Session 3	2:00 pm - 3:30 pm	**Computer Vision using CNN:** > Convolutional Neural Networks Intuition > Understand convolution, max pooling, flattening in depth > Hands-on: Building a CNN to classify cat and dogs
Tea Break - (3:30 am - 3:45 am)		
Session 4	3:45 pm - 5:00 pm	**Evaluating, Improving and Tuning ANN and CNN: Hands-on** > Evaluating the ANN and CNN > Improving the ANN and CNN > Tuning the ANN and CNN

Note : Add Ons will be completed if time permits to do so.

AddOns :

> Transfer Learning on VGG16, Reasonet50 or Inception model

> Fine Tuning on VGG16, Reasonet50 or Inception model