1 Week Machine Learning & Artificial Intelligence Course Contents

Days	Topics
Day 1	**Introduction to Data Manipulation and Data Visualization** Introduction to Data Science, Flow of Data Science, Numpy, Pandas, Matplotlib **Lab**: Data Manipulation using Numpy and Pandas, Data Visualization in different Graphs.
Day 2	**Introduction to Machine Learning** Introduction, Types of Machine Learning: Supervised, Unsupervised and Reinforcement learning, Applications, Classification vs Prediction Problems, Linear Regression Algorithm (Prediction Problem), Mean Square Error, R2 Score, Introduction to KNN (K Nearest Neighbor), Working of KNN, Decide the value of K, Confusion Matrix, Accuracy Score **Lab**: Employee Salary Prediction using Linear Regression, IRIS Flower Classification using KNN
Day 3	**Introduction to Web Scraping and NLP** What is web scraping, Need of Web Scraping, Web Scraping Basics Natural Language Processing: Introduction, Stages in natural language Processing, Application of NLP in Real world applications Lab: Scraping Amazon Website / Flipkart Website Product User Reviews**,** Sentiment analysis using Natural Language Toolkit (NLTK), Live Twitter Tweets Sentiment Analysis, Amazon Product Review, Sentiment Analysis
Day 4	**Introduction to Image Processing (Open CV) and Face Detetion** Introduction to Open CV, Reading Image, ROI, Haarcascade Concept, Face Detection, Working with Webcam **Lab**: Reading and Converting image to Array, Image Processing, Displaying Images, Drawing Different Shapes on Images, Face/Smile/Eyes Detection through Image and Live Webcam, Object Detection by Color
Day 5	**Introduction to Artificial Intelligence (ANN and CNN)** Artificial Intelligence: Introduction, Typical Applications, Keras API.Artificial Neural Networks (ANNs): Concept, Activation Functions, Feed Forward Neural Networks and Back Propagation MNIST Data Set, Different types of MNIST Dataset, Importing Image Samples from MNIST Dataset, Analyzing samples of images in MNIST Dataset. Introduction, Working of CNN, Convolutional Layer, Pooling, Flatten, Image recognition techniques and feature Extraction fundamentals. **Lab**: Creating Simple Neural Network From Scratch, Hand-written digit recognition using Neural networks Using Tensorflow Library, Image identification and classification project (Cats Vs Dogs) Using CNN

2 Weeks Machine Learning & Artificial Intelligence Course Contents

Days	Topics
Day 1	**Introduction to Data Manipulation and Data Visualization** Introduction to Data Science, Flow of Data Science, Numpy, Pandas, Matplotlib **Lab**: Data Manipulation using Numpy and Pandas, Data Visualization Using Matplotlib on different types of Graphs.
Day 2	**Introduction to Machine Learning** Introduction, Types of Machine Learning: Supervised, Unsupervised and Reinforcement learning, Applications, Classification vs Prediction Problems, Linear Regression Algorithm (Prediction Problem),Mean Square Error, R2 Score **Lab**: Employee Salary Prediction using Linear Regression
Day 3	**Introduction to KNN** Introduction to KNN (K Nearest Neighbor), Working of KNN, Decide the value of K, Confusion Matrix, Accuracy Score **Lab**: IRIS Flower Classification using KNN
Day 4	**Introduction to Web Scraping** What is web scraping, Need of Web Scraping, Web Scraping Basics **Lab**: Scraping Amazon Website / Flipkart Website Product User Reviews
Day 5	**Introduction to NLP** Natural Language Processing: Introduction, Stages in natural language Processing, Application of NLP in Real world applications **Lab**: Sentiment analysis using Natural Language Toolkit (NLTK), Live Twitter Tweets Sentiment Analysis, Amazon Product Review, Sentiment Analysis

Days	Topics
Day 6	**Introduction to Image Processing (Open CV)** Introduction to Open CV, Reading Image, ROI **Lab**: Reading and Converting image to Array, Image Processing, Displaying Images , Drawing Different Shapes on Images, Converting image to different filters.
Day 7	**Introduction to Face Detection** Haarcascade Concept , Face Detection, Working with Webcam, **Lab**: Face/Smile/Eyes Detection through Image and Live Webcam, Object Detection by Color
Day 8	**Introduction to Artificial Intelligence** Artificial Intelligence: Introduction, Typical Applications, Keras API.Artificial Neural Networks (ANNs): Concept, Activation Functions, Feed Forward Neural Networks and Back Propagation **Lab**: Creating Simple Neural Network From Scratch
Day 9	**ANN for Image Classification** MNIST Data Set, Different types of MNIST Dataset, Importing Image Samples from MNIST Dataset, Analyzing samples of images in MNIST Dataset. **Lab**: Hand-written digit recognition using Neural networks Using Tensorflow Library
Day 10	**Introduction to Convolutional Neural Network (CNN)** Introduction, Working of CNN, Convolutional Layer, Pooling, Flatten, Image recognition techniques and feature Extraction fundamentals. **Lab**: Image identification and classification project (Cats Vs Dogs) Using CNN