

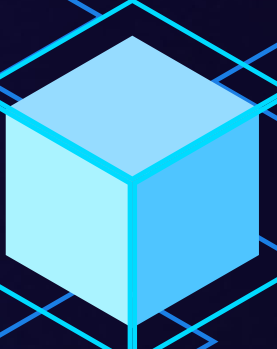
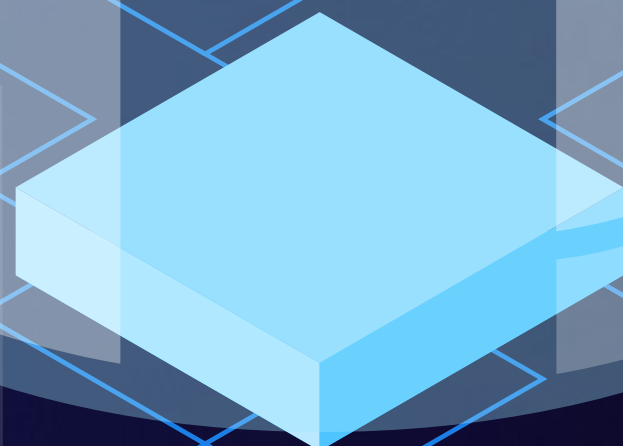
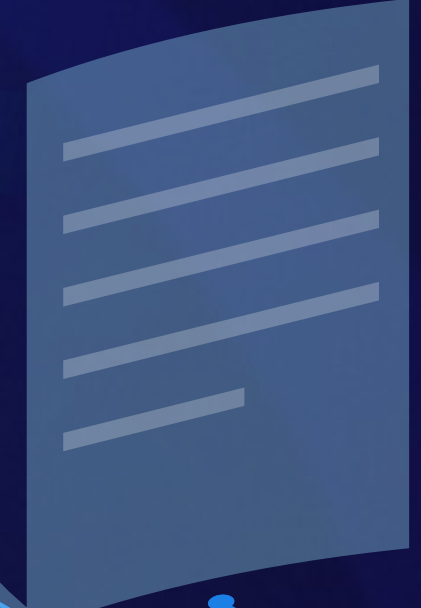
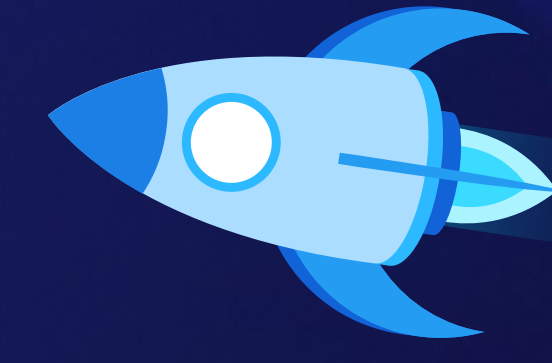
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MACHINE



LEARNING SYLLABUS



□ Module 1 – Machine Learning Home and Introduction

- Prerequisites

- Machine Learning – Introduction

□ Getting Started with Machine Learning

□ An Introduction to Machine Learning

□ What is Machine Learning ?

□ Introduction to Data in Machine Learning

□ Demystifying Machine Learning

□ ML – Applications

□ Best Python libraries for Machine Learning

□ Artificial Intelligence | An Introduction

□ Machine Learning and Artificial Intelligence

□ Difference between Machine learning and Artificial Intelligence

□ Agents in Artificial Intelligence

- Machine Learning - What Today's AI Can Do?

- Machine Learning - Traditional AI

- Machine Learning - What is Machine Learning?

- Machine Learning – Categories

□ **Module 2 – Data and It's Processing**

- **Introduction to Data in Machine Learning**
- **Understanding Data Processing**
- **Python | Create Test DataSets using Sklearn**
- **Python | Generate test datasets for Machine learning**
- **Python | Data Preprocessing in Python**
- **Data Cleaning**
- **Feature Scaling – Part 1**
- **Feature Scaling – Part 2**
- **Python | Label Encoding of datasets**
- **Python | One Hot Encoding of datasets**
- **Handling Imbalanced Data with SMOTE and Near Miss Algorithm in Python**
- **Dummy variable trap in Regression Models**

□ **Module 3 – Supervised learning**

- **Getting started with Classification**
- **Basic Concept of Classification**
- **Types of Regression Techniques**
- **Classification vs Regression**
- **ML | Types of Learning – Supervised Learning**
- **Multiclass classification using scikit-learn**
- **Gradient Descent:**
- **Linear Regression:**
- **Python | Implementation of Polynomial Regression**
- **Softmax Regression using TensorFlow**
- **Logistic Regression**
- **Naive Bayes Classifiers**
- **Support Vector**
- **Decision Tree**
- **Random Forest**

□ Module 4 – Unsupervised learning

- ML | Types of Learning – Unsupervised Learning
- Supervised and Unsupervised learning
- Clustering in Machine Learning
- Different Types of Clustering Algorithm
- K means Clustering – Introduction
- Elbow Method for optimal value of k in KMeans
- Random Initialization Trap in K-Means
- ML | K-means++ Algorithm
- Analysis of test data using K-Means Clustering in Python
- Mini Batch K-means clustering algorithm
- Mean-Shift Clustering
- DBSCAN – Density based clustering
- Implementing DBSCAN algorithm using Sklearn
- Fuzzy Clustering
- Spectral Clustering
- OPTICS Clustering
- OPTICS Clustering Implementing using Sklearn
- Hierarchical clustering (Agglomerative and Divisive clustering)
- Implementing Agglomerative Clustering using Sklearn
- Gaussian Mixture Model

□ Module 5 – Reinforcement Learning:

- Reinforcement learning**
- Reinforcement Learning Algorithm :
Python Implementation using Q-learning**
- Introduction to Thompson Sampling**
- Genetic Algorithm for Reinforcement Learning**
- SARSA Reinforcement Learning**
- Q-Learning in Python**

Module 6 – Dimensionality Reduction

- Introduction to Dimensionality Reduction
- Introduction to Kernel PCA
- Principal Component Analysis(PCA)
- Principal Component Analysis with Python
- Low-Rank Approximations
- Overview of Linear Discriminant Analysis (LDA)
- Mathematical Explanation of Linear Discriminant Analysis (LDA)
- Generalized Discriminant Analysis (GDA)
- Independent Component Analysis
- Feature Mapping
- Extra Tree Classifier for Feature Selection
- Chi-Square Test for Feature Selection – Mathematical Explanation
- ML | T-distributed Stochastic Neighbor Embedding (t-SNE) Algorithm
- Python | How and where to apply Feature Scaling?
- Parameters for Feature Selection
- Underfitting and Overfitting in Machine Learning

□ Module 7 – Natural Language Processing

- **Introduction to Natural Language Processing**
- **Text Preprocessing in Python | Set – 1**
- **Text Preprocessing in Python | Set 2**
- **Removing stop words with NLTK in Python**
- **Tokenize text using NLTK in python**
- **How tokenizing text, sentence, words works**

- **Introduction to Stemming**
- **Stemming words with NLTK**
- **Lemmatization with NLTK**
- **Lemmatization with TextBlob**
- **How to get synonyms/antonyms from NLTK WordNet in Python?**

□ **Module 8 - Neural Networks**

- **Introduction to Artificial Neural Networks | Set 1**
- **Introduction to Artificial Neural Network | Set 2**
- **Introduction to ANN (Artificial Neural Networks) | Set 3 (Hybrid Systems)**
- **Introduction to ANN | Set 4 (Network Architectures)**
- **Activation functions**
- **Implementing Artificial Neural Network training process in Python**
- **A single neuron neural network in Python**
- **Convolutional Neural Networks**
- **Recurrent Neural Networks**
- **GANs – Generative Adversarial Network**
- **Introduction to Deep Q-Learning**
- **Implementing Deep Q-Learning using Tensorflow**

□ Module 9 - ML – Deployment

- Deploy your Machine Learning web app (Streamlit) on Heroku
- Deploy a Machine Learning Model using Streamlit Library
- Deploy Machine Learning Model using Flask
- Python – Create UIs for prototyping Machine Learning model with Gradio
- How to Prepare Data Before Deploying a Machine Learning Model?
- Deploying ML Models as API using FastAPI
- Deploying Scrapy spider on ScrapingHub

□ Module 9 - Machine Learning - Deep Learning

- Applications
- Untapped Opportunities of Deep Learning
- What is Required for Achieving More Using Deep Learning
- Deep Learning Disadvantages

□ Module 10 - ML – Applications:

- Rainfall prediction using Linear regression
- Identifying handwritten digits using Logistic Regression in PyTorch
- Kaggle Breast Cancer Wisconsin Diagnosis using Logistic Regression
- Python | Implementation of Movie Recommender System
- Support Vector Machine to recognize facial features in C++
- Decision Trees – Fake (Counterfeit) Coin Puzzle (12 Coin Puzzle)
- Credit Card Fraud Detection
- NLP analysis of Restaurant reviews
- Applying Multinomial Naive Bayes to NLP Problems
- Image compression using K-means clustering
- Deep learning | Image Caption Generation using the Avengers EndGames Characters
- How Does Google Use Machine Learning?
- How Does NASA Use Machine Learning?
- 5 Mind-Blowing Ways Facebook Uses Machine Learning
- Targeted Advertising using Machine Learning
- How Machine Learning Is Used by Famous Companies?

□ **Other topics(optional):**

- Machine Learning - Mean Median Mode
- Machine Learning - Standard Deviation
- Machine Learning - Percentiles
- Machine Learning - Data Distribution
- Machine Learning - Normal Data Distribution
- Machine Learning - Scatter Plot
- Machine Learning - Linear Regression
- Machine Learning - Polynomial Regression
- Machine Learning - Multiple Regression
- Machine Learning - Scale
- Machine Learning - Train/Test
- Machine Learning - Decision Tree
- Machine Learning - Confusion Matrix
- Machine Learning - Hierarchical Clustering
- Machine Learning - Logistic Regression
- Machine Learning - Grid Search
- Preprocessing - Categorical Data
- Machine Learning - K-means
- Machine Learning - Bootstrap Aggregation (Bagging)
- Machine Learning - Cross Validation
- Machine Learning - AUC - ROC Curve
- Machine Learning - K-nearest neighbours (KNN)

□ **Course Features:**

- Theory and Labs
- Special and Easily Understandable Notes