



Data Analytics and Machine Learning

Syllabus : Data Analytics, Machine Learning and Deep Learning

Duration: 30 days

Day 1

Terminologies - AI, Machine Learning, Deep Learning, Big Data, Hadoop

Introduction to Python Language

- Download and install Python
- Features of Python
- Python Application Areas with real time examples
- Conditional and Looping Constructs

Day 2, 3

Sequences

- List
- Tuple
- String
- Set
- Dictionary
- Shallow copy and Deep Copy

Day 4

Functions

- Define functions
- Function Arguments & Return values
- Local and global variables

Day 5

Packages

- Packages
- Import statements
- Install packages using PIP

Sqlite & MySql Databases

- Connecting to db
- CRUD operations

Day 6

- Numpy

Day 7

- Pandas



Day 8

- ❑ Matplotlib
- ❑ Seaborn – HeatMap, Correlation analysis, Count Plot

Day 9

Introduction to Machine Learning

- ❑ What is Machine Learning?
- ❑ Applications
- ❑ Steps in ML
- ❑ Scikit-Learn
- ❑ Basic example using Linear Regression
- ❑ Accuracy Score

Day 10

Data Analytics

- ❑ Data mining concepts and applications
 - ❑ What is data mining?
 - ❑ What kinds of Data Can Be Mined?
 - Database data
 - Data Warehouses
 - Transactional Data
 - Other kinds of Data
 - ❑ Which Technologies are used?
 - Statistics
 - Machine Learning
 - Database Systems and Data Warehouses
 - Information Retrieval



- ❑ Major issues in Data Mining
 - Mining Methodology
 - User Interaction
 - Efficiency and Scalability
 - Diversity of Database Types
 - Data Mining and Society

Day 11

- ❑ Data Mining Stages
 - ❑ Selection of target data: Introduce Dataset sources.
 - ❑ Need for data preprocessing
 - ❑ Major tasks in preprocessing

Day 12

- ❑ Data Cleaning (Wrangling)
 - ❑ Missing Data, Dealing with Categorical Data
 - ❑ Noisy Data
 - ❑ Rescale data , Binarize data, Standardize Data

Day 13

- ❑ Data integration
 - ❑ Entity Identification Problem
 - ❑ Redundancy and Correlation Analysis
 - ❑ Tuple Duplication
 - ❑ Data Value Conflict Detection and Resolution

Day 14

- ❑ Data reduction
 - ❑ Overview of Data Reduction Strategies
 - ❑ Dimensionality reduction : PCA, Attribute Subset selection
 - ❑ Data cube aggregation
 - ❑ Data compression

Day 15

- ❑ Web Mining (Web Scraping)
- ❑ Web content mining
- ❑ Web usage mining – (log files)
- ❑ Web structure mining

Day 16

- ❑ Working example of web scraping using scrapy

Day 17

Machine Learning with Python

- ❑ Shallow Learning and Deep Learning
- ❑ Learning Methods



Day 18

- ❑ Supervised Learning
 - ❑ Regression
 - Linear (Value Prediction)
 - Logistic (Categorical)
 - Decision Tree Regressor
 - Random Forest Regressor
 - Cross validation – K-fold

Day 19

- ❑ Classification
 - Decision Tree
 - Random Forest
 - Support Vector Machine
 - Naïve Bayes classifier
 - K nearest neighbors
 - Cross validation – K-fold & Confusion matrix

Day 20

- ❑ Unsupervised Learning (Data mining)
 - Clustering –
Categorization of clustering methods.
 1. Partitioning method:
K-Means and K-Medoid Clustering.
 2. Hierarchical Clustering method:
BIRCH.
 3. Density-Based Clustering :
DBSCAN and OPTICS.



Day 21

☐ Association:

Association Rules Mining: Concepts

1. Apriori and FP-Growth Algorithm.
2. Hidden Markov Model

Day 22

☐ Reinforcement Learning

- Q-Learning
- Deep Q-Network

Day 23, 24

☐ Real time project examples – Supervised, Unsupervised

- Recommender system
- Time series analysis

Neural Networks & Deep Learning

Day 25

- ☐ Human Cognitive Abilities
- ☐ Neural Networks & similarity to human brain



- ❑ Real life applications
 - Image Recognition
 - Object detection
 - NLP
 - Time Series Analysis

Day 26

- ❑ Neural Network
 - Deep Neural Network
 - Convolutional Neural Network
 - Recurrent Neural Network
 - Deep Belief Network.

Day 27

- ❑ Working of neural network using mathematical visualization
 - Gradient descent
 - Activation – ReLu, Sigmoid, Tan h
 - Backward propagation
 - Feed Forward Network
 - Weight and bias
 - Filters for CNN

Day 28

- ❑ TensorFlow Basics



Day 29

- ❑ Handwriting Recognition using MNIST dataset

Day 30

- ❑ Project

Contact Us

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