

ML & DL SYLLABUS

Chapter 1: An Introduction to Python

1. Introductory Remarks about Python
2. Strengths and Weaknesses
3. A Brief History of Python
4. Python Versions
5. Installing Python
6. Environment Variables
7. Executing Python from the Command Line
8. IDLE
9. Editing Python Files
10. Getting Help
11. Dynamic Types
12. Python Reserved Words
13. Naming Conventions

Chapter 2: Basic Python Syntax

1. Introduction
2. Basic Syntax

3. Comments
4. String Values
5. String Operations
6. The format Method
7. String Slices
8. String Operators
9. Numeric Data Types
10. Conversions
11. Simple Input and Output
12. The print Function

Chapter 3: Language Components

1. Introduction
2. Control Flow and Syntax
3. Indenting
4. The if Statement
5. Relational Operators
6. Logical Operators
7. True or False

8. Bit Wise Operators

9. The while Loop

10. Break and continue

11. The for Loop

Chapter 4: Collections

1. Introduction

2. Lists

3. Tuples

4. Sets

5. Dictionaries

6. Sorting Dictionaries

7. Copying Collections

8. Summary

Chapter 5: Functions

1. Introduction

2. Defining Your Own Functions

3. Parameters

4. Function Documentation

5. Keyword and Optional Parameters

6. Passing Collections to a Function

7. Variable Number of Arguments

8. Scope

9. Functions - "First Class Citizens"

10. Passing Functions to a Function

11. Mapping Functions in a Dictionary

12. Lambda

13. Closures

Chapter 6: Modules

1. Modules

2. Standard Modules – sys

3. Standard Modules – math

4. Standard Modules – time

5. The dir Function

Chapter 7: Exceptions

1. Errors

2. Run Time Errors

3. The Exception Model

4. Exception Hierarchy

5. Handling Multiple Exceptions

6. Raise

7. Assert

8. Writing Your Own Exception Classes

Chapter 8: Input and Output

1. Introduction

2. Data Streams

3. Creating Your Own Data Streams

4. Access Modes

5. Writing Data to a File

6. Reading Data from a File

7. Additional File Methods

8. Using Pipes as Data Streams

9. Handling IO Exceptions

10. Working with Directories

11. Metadata

12. The pickle Module

Chapter 9: Classes in Python

1. Classes in Python

2. Principles of Object Orientation

3. Creating Classes

4. Instance Methods

5. File Organization

6. Special Methods

7. Class Variables

8. Inheritance

9. Polymorphism

10. Type Identification

11. Custom Exception Classes

12. Class Documentation – pydoc

Chapter 10: Regular Expressions

1. Introduction

2. Simple Character Matches

3. Special Characters
4. Character Classes
5. Quantifiers
6. The Dot Character
7. Greedy Matches
8. Grouping
9. Matching at Beginning or End
10. Match Objects
11. Substituting
12. Splitting a String
13. Compiling Regular Expressions
14. Flags



Machine Learning

- Machine Learning with Python
- Defining Machine Learning
- Implementation of Machine Learning
- Algorithms
- Learning NumPy and Scipy
- Learning - Supervised or Unsupervised
- Supervised, Unsupervised Learning and Classification
- Classification and k-Nearest Neighbours (kNN)
- Building, Testing, and Measuring the Performance of the Classifier
- Defining Clustering Problem
- k-Means Clustering

Deep Learning

Topic 1:

- Setting Up Environment for Deep Learning
- Keras, Tensorflow, Jupyter etc
- Quick overview of Python

Topic 2:

- Theoretical Foundation of Deep Learning
- Overview of Deep Learning
- Deep Learning vs Machine Learning
- Phases of Deep Learning Project

Topic 3:

- Understanding Neural Network
- How neural networks learn
- Architecture of Neural

- Convolution Neural Networks
- Recurrent Neural Networks

Topic 4:

- Data Preprocessing
- Learning Pandas for Data Preprocessing

Topic 5:

- Data Visualization
- Using matplotlib & Seaborn for Data visualization

Topic 6:

- Convolution Neural Networks for Image Processing
- Theory and practical project

Topic 7:

- Recurrent Neural Networks for Natural Language Processing
- Theory and practical project

Topic 8: Panda, Scikit

- Defining Panda
- Pandas – Creating and Manipulating Data
- How to Create Data Frames?
- Importance of Grouping and Sorting
- Plotting Data
- Understanding Scikit-Learn
- Algorithms for Scikit-Learn