

Advanced Python(Some Topic)

Topic 1 : Regular expression

2 Lectures

- Understanding regular expressions
- String v/s Regular expression string
- “re” module functions
- Different functions like Match(), Search(), Split(), Findall(), Compile(), Sub(), Subn()
- Simple character matches
- Special characters and Character classes
- Mobile number extraction and Mail extraction
- Different Mail ID patterns
- Data extraction
- Password extraction
- URL extraction

Topic 2 : Modules in depth

2 Lectures

- Maths module
- OS module
- Sys module
- Statistical module
- Random module
- Plot the Google Map using folium package in Python

Topic 3 : Data analytics modules

2 Lectures

- Introduction of Numpy
- Introduction of Scipy
 - Arrays, Datatypes and Matrices
 - N dimension arrays
 - Indexing and Slicing
- Introduction of Pandas
 - Data Frames
 - Merge , Join, Concat

- Matplotlib introduction
 - Drawing plots
- Introduction to Machine learning
- Types of Machine Learning?
- Introduction to Data science

Topic 4 : DJANGO

2 Lectures

- Introduction to PYTHON Django
- Purpose of Web framework?
- About Frameworks?
- Define MVT Design Pattern
- Difference between MVC and MVT

Topic 5 : Data Science with Python Core Skills

Topic 5.1 : PANDAS

6 Lectures

- Introduction
- Environment Setup
- Introduction to Data Structures
 - Dimension & Description
 - Series and DataFrame
 - Data Type of Columns
 - Panel
- Pandas — Series
 - Series
 - Create an Empty Series
 - Create a Series f
 - from ndarray, from dict, from Scalar
- Accessing Data from Series with Position
- Retrieve Data Using Label (Index)
- DataFrame
 - What is DataFrame
 - Create DataFrame and an Empty DataFrame
 - Create a DataFrame from Lists
 - Create a DataFrame from Dict of ndarrays / Lists
 - Create a DataFrame from List of Dicts
 - Create a DataFrame from Dict of Series

- Column Selection, addition and deletion
 - Row Selection, Addition, and Deletion
- Panel
 - Panel()
 - Create Panel
 - Selecting the Data from Panel
- Basic Functionality
- Descriptive Statistics
 - Functions & Description
 - Summarizing Data
- Function Application
 - Table-wise Function Application
 - Row or Column Wise Function Application
 - Element Wise Function Application
- Iteration
 - Iterating a DataFrame
 - iteritems()
 - iterrows()
 - itertuples()
- Sorting
 - By Label
 - Sorting Algorithm
- Working with Text Data
- Indexing and Selecting Data
- Statistical Functions
- Window Functions
- Missing Data
 - Cleaning / Filling Missing Data
 - Replace NaN with a Scalar Value
 - Fill NA Forward and Backward
 - Drop Missing Values
 - Replace Missing (or) Generic Values
- GroupBy
 - Split Data into Groups
 - View Groups
 - Iterating through Groups
 - Select a Group

- Aggregations
- Transformations
- Filtration
- Merging/Joining
- Concatenation
- Date Functionality
- Timedelta
- Categorical Data
- Pandas – Visualization
 - Bar Plot
 - Histograms
 - Box Plots
 - Area Plot
 - Scatter Plot

Topic 5.2 : NUMPY

10 Lectures

- Introduction
- Environment
- Ndarray Object
- Data Types
 - Data Type Objects (dtype)
- Array Attributes
 - shape
 - ndim
 - itemsize
 - flags
- Array Creation Routines
 - empty
 - zeros
 - ones
- Array From Existing Data
- Array From Numerical Ranges
- Indexing & Slicing
- Advanced Indexing
 - Integer Indexing
 - Boolean Array Indexing
- Broadcasting

- Iterating Over Array
 - Iteration
 - Order
 - Modifying Array Values
 - External Loop
 - Broadcasting Iteration
- Numpy – Array Manipulation
 - reshape
 - ndarray.flat, ndarray.flatten
 - ravel
 - transpose
 - ndarray.T
 - swapaxes
 - rollaxis
 - broadcast, broadcast_to
 - expand_dims
 - squeeze
 - concatenate
 - stack
 - hstack and numpy.vstack
 - split, split and numpy.vsplit
 - resize
 - append, insert, delete, unique
- Binary Operators
 - bitwise_and
 - bitwise_or
 - invert(), left_shift, right_shift
- String Functions
- Mathematical Functions
- Trigonometric Functions
- Functions for Rounding
- Numpy – Arithmetic Operations
 - reciprocal()
 - power()
 - mod()
- Statistical Functions
 - amin() and numpy.amax()

- ptp()
- percentile()
- median()
- mean()
- average()
- Standard Deviation
- Variance
- Sort, Search & Counting Functions
 - sort(), argsort(), lexsort()
 - argmax() and numpy.argmin()
 - nonzero()
 - where()
 - extract()
- Numpy – Matrix Library
 - empty()
 - matlib.zeros()
 - matlib.ones()
 - matlib.eye()
 - matlib.identity()
 - matlib.rand()
- Numpy – Histogram Using Matplotlib
 - histogram()
 - plt()

Topic 6 : OpenCv

4 Lectures

- Getting Started with Images
- Basic Image Manipulation
- Image Annotation
- Image Enhancement
- Accessing the Camera
- Read and Write Videos
- Image Filtering and Edge Detection
- Image Features and Image Alignment
- Image Stitching and Creating Panoramas
- High Dynamic Range Imaging (HDR)
- Object Tracking
- Face Detection
- Object Detection

- Pose Estimation using OpenPose

Topic 7: NLP

4 Lectures

- Introduction to NLP
- Natural Language Process (NLP)
- ChatBots
- Human Lang VS Computer Lang
- Data Processing
- Bag of word Algorithm
- TFIDF

Topic 8: NLP - Natural Language Toolkit

- What is NLTK?
- NLTK Installation Process
- Accessing a dataset in NLTK
- Data pre-processing
- Tokenization
- Word Tokenization
- Sentence Tokenization
- Punctuation Removal
- Stop Words Removal
- Stemming
- Lemmatization
- POS Tagging
- Chunking
- Synonyms using wordnet
- Word Embedding
- Project in NLP - As a final project in NLP, we will be building a text classification model using NLP.

Topic 9 : Project

6 Lectures