# Python Basics

Class 1 – Introduction

* What is python?
* Why we need it?
* Why is it so popular?
* What is role of python in Data Science?
* Difference between ML , AI, Data Science

Class 2 – operators

* Types of Operators in Python:
  + # Assignment Operators
  + # Comparison Operators
  + # Identity Operators
  + # Bitwise Operators
  + # Arithmetic Operators
  + # Logical Operators
  + # Membership Operators
* variables
  + # What is Varaible
  + # How to create it?
  + # Rules of naming a variable
  + # Use of variable

Class 3 – data types (int,str,float,bool)

* # What is int?
* # What is float?
* # what is str ?
* # what is bool?

implicit conversion

* (int to str,
* str to int,
* float to int,
* int to float)

Class 4 – list

Learn various concepts and methods in list

* + - Indexing,
      * #positive index value to element
      * #elment to positive index value
      * #elment to negative index value
    - Slicing,
      * #slicing & skiping one element
      * #slicing & skiping two element
      * #reverse slicing & skiping zero element for negavite index
      * #reverse slicing & skiping one element for negavite index
    - item assignment,
    - Add,
      * Append
      * Insert
    - Remove,
      * Remove
      * Del
      * Clear
    - Copy

Class 5 – Learn various concepts and methods in string

* indexing,
* slicing,
* Replace,
* Join,
* Split,
* Capitalize,
* Title
* #title
* #upper
* #lower
* #Count

Class 6 – Learn various concepts and methods in tuple

* indexing
* Slicing
* Immutable
* #Tuple convert to List
* #Tuple modifying by convert to List
* #List converting to Tuple

Learn various concepts and methods in set

* Difference between set,tuple and dict
* intersection.
* Union,
* Difference,
* unique elements
* Unordered
* #Adding in set
* #Removing in set
* #Finding the common element
* #update

Class 7 - Learn various concepts and methods in dict

* key value relationship
* Items
* Add
* Remove,
* unique keys
* Key value difference

Class 8- Conditional Statement

* If
* If elif
* If elif else

Class 9 - Loops

* For loop
* Examples for for loop
* While loop
* Examples for while loop

Class 10- 14 – Assignment practice,Revision and Doubt

class 15 - Miscellaneous topics

* lamda,
* Filter,
* Map
* Reduce
* list comprehension

class 16 -OOPs

* How to create Functions,
* Why are function required?
* Difference between return and print statement
* What is Class,
* What Object,
* What is self,
* Inheritance,
  + Single level Inheritance
  + Multilevel Inheritance,
  + Multiple Inheritance,
  + Hierarchical Inheritance

Class 17 –OOPs

* Polymorphism,
* Encapsulation,
* Abstraction
* Constructor
* parameterized default constructor,
* unparameterized default constructor

Class 18 -decorator

* Why do we need decorator
* How to create decorator

Class 19- generators

* Why do we need generator
* How to use next
* How to use yield
* Difference between return and yield

# Python Libraries and Data Analysis

Class 20 Numpy

* 1-Dimensional Array,
* 2-Dimensional Array,
* np.zeros,
* np.ones,
* Np.full
* Np.arange,
* np.linespace,
* Np.random,
* modify shapes,
* Mathematical functions of numpy; np.multiply etc
* Array compare, Aggregate functions like mean, sqrt,min,max etc
* Concept of broadcasting
* Indexing and slicing
* Array Manipulation, hstack, vstack etc

Class 20-21- pandas

* Creating a dataframe
* Reading in csv, excel data
* Df.info
* Changing the datatypes
* Df.head, df.tail, df.describe
* Renaming columns
* Finding missing values
* Filling missing values
* Creating a pandas series and dataframe
* remove select single or multiple rows and columns
* Merging two dataframes
* merge tables based on one columns or multiple columns)
* Joining two dataframes
* Loc and iloc method to identify columns and rows

Class 22 - Matplotlib

* Line plot
* Changing color, size, style of line plot
* Scatter plot, customizing scatter plot
* Bar plot
* Histogram, customizing histogram
* Subplots
* Pieplot
* Doughnut plot, Area chart

Class 23- Seaborn

* Countplot
* Histplot
* Pairplot
* Boxplot
* Barplot
* Hue
* Univariate analysis
* Multivariate analysis

Class 24- Project - Exploratory data analysis on iris

Class 25- Project - Exploratory data analysis on haberman dataset

**Statistics**

**C**lass 26 - Descriptive Statistics

* Types of Analytics
  + Descriptive statistics
  + Diagnostics statistics
  + Predictive statistics
  + Prescriptive statistics
* Concept of population and mean
* Mean,Meduim,mode
* Variance

Class 27- Continuation

* Types of Data
  + **Quantitative**
  + **Qualitative**
  + **Nominal**
  + **Ordinal**
  + **Interval**
  + **Ratio**

Class 26- Introduction to machine learning

* use of machine learning and
* practical use with example
* pipeline

Class 27 -

* Pipeline
* NLP
* cleaning
* Stemming
* lemmatization
* BOW
* TFIDF

Class 28 - Dimension Reduction - PCA ,

* why dimension reduction required
* why dimension reduction required
* Eigen values and eigen vector
* Implementation of PCA

class 29 - Data Processing

* Standardization,
* normalization,
* handle missing value
* one hot encoding
* label encoding

Class 30-31-KNN ( Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 32-Naïve Bayes ( Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 33-logistic regression (Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 34- linear regression (Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 35 – decision tree (Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 36- Random Forest (Theoretical analysis with implementation on iris ,haberman,titanic dataset)

Class 37 – xgboost (Theoretical analysis with implementation on iris ,haberman,titanic dataset)

class 38 - Unsupervised Learning - K Means

class 39 - k means implementation

Class 39-42 – Practice

Class 43 Flask Framework POST GET request, POSTMAN,

Class 44 – heroku to deploy machine learning models

Class 45 - Personalized cancer prediction

class 46 - Quora question Pair similarity

class 47- NER using spacy

class 48 - Sentiment analysis

class 49 - 50 Amazon food clustering algorithm

Class 51 - Deep learningmodule 8 classes more