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Module-1: Python Foundation (Mandatory)

- What is Python and history of Python?
- Why Python and where to use it?
- Discussion about Python 2 and Python 3
- Set up Python environment for development
- Demonstration on Python Installation
- Discuss about IDE's like IDLE, Pycharm and Enthought Canopy
- Discussion about unique feature of Python
- Write first Python Program
- Start programming on interactive shell.
- Using Variables, Keywords
- Interactive and Programming techniques
- Comments and document interlude in Python
- Practical use cases using data analysis

Introduction to Hadoop

- **Core Objects and Built-in Functions**
 - Python Core Objects and builtin functions
 - Number Object and operations
 - String Object and Operations
 - List Object and Operations
 - Tuple Object and operations
 - Dictionary Object and operations
 - Set object and operations
 - Boolean Object and None Object
 - Different data Structures, data processing
 - Conditional Statements and Loops

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- What are conditional statements?
- How to use the indentations for defining if, else, elif block
- What are loops?
- How to control the loops
- How to iterate through the various object
- Sequence and iterable objects

UDF Functions and Object Functions

- What are various type of functions
- Create UDF functions
- Parameterize UDF function, through named and unnamed parameters
- Defining and calling Function
- The anonymous Functions - Lambda Functions
- String Object functions
- List and Tuple Object functions
- Dictionary Object functions

File Handling with Python

- Process text files using Python
- Read/write and Append file object
- File object functions
- File pointer and seek the pointer
- Truncate the file content and append data
- File test operations using os.path

Module-2 : Python Advance (Mandatory)

- Python inbuilt Modules
- os, sys, datetime, time, random, zip modules
- Create Python UDM – User Defined Modules
- Define PYTHONPATH
- Create Python Packages
- init File for package initialization

Exceptional Handling and Object Oriented Python

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- Python Exceptions Handling
- What is Exception?
- Handling various exceptions using try....except...else
- Try-finally clause
- Argument of an Exception and create self exception class
- Python Standard Exceptions
- Raising an exceptions, User-Defined Exceptions
- Object oriented features
- Understand real world examples on OOP
- Implement Object oriented with Python
- Creating Classes and Objects, Destroying Objects
- Accessing attributes, Built-In Class Attributes
- Inheritance and Polymorphism
- Overriding Methods, Data Hiding
- Overloading Operators

Debugging, Framework & Regular expression

- Debug Python programs using pdb debugger
- Pycharm Debugger
- Assert statement for debugging
- Testing with Python using unittest Framework
- What are regular expressions?
- The match and search Function
- Compile and matching
- Matching vs searching
- Search and Replace feature using RE
- Extended Regular Expressions
- Wildcard characters and work with them

Database interaction with Python

- Creating a Database with SQLite 3,
- CRUD Operations,

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- Creating a Database Object.
- Python MySQL Database Access
- DML and DDL Operations with Databases
- Performing Transactions
- Handling Database Errors
- Disconnecting Database

Package Installation, Windows spreadsheet parsing and webpage scrapping

- Install package using Pycharm
- What is pip, easy_install
- Set up the environment to install packages?
- Install packages for XLS interface and XLS parsing with Python
- Create XLS reports with Python
- Introduction to web scrapping and beautiful soup

Module 3 : Python for Data Science/Analytics (Optional Module)

Introduction to Statistics

- Statistics overview
- Categorical data displays
- Different Type of variable
- Mean and median: The basics
- More on mean and median
- Two-way tables for categorical data
- Dot plots and frequency tables
- Histograms
- Comparing features of distributions
- Line graphs
- Population variance and standard deviation
- Sample variance and standard deviation

Machine Learning with Python

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- Understanding Machine Learning?
- Areas of Implementation of Machine Learning,
- Why companies prefer ML
- Major Classes of Learning Algorithms
- Supervised vs Unsupervised Learning, Learning
- Why Numpy?
- Learn Numpy and Scipy,
- Basic plotting using Matplotlib
- Algorithms using Skikit learn
- Data Analysis with Pandas

- What is Pandas
- Creating Series and Data Frames
- Data Mining, Data Extraction, Data Analysis
- Data Filter, Data Merging and Data Appending
- Grouping, Sorting
- Reading CSV, JSON, XML, XLS using pandas
- Plotting Data/Create Graphs and Analysis using Matplotlib
- Data analysis with data set
- Hadoop dataprocessing with Python

Introduction of Big Data

- Why Big Data
- Hadoop Eco system
- Understanding problem statements
- Market data Analysis with Python
- HDFS file system
- Cloudera Cluster of single node
- Map Reduce using Python

Introduction to MrJob Package

Mini Projects:

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- Data Analysis of TCS trade share (NSE) using MySQL Database system
- Data Analysis of IMDB Movies dataset using Pandas Framework
- Develop Hadoop Map Reduce to process 10M records from movielens dataset and do analysis
- Predict Stock and house price using machine learning algorithm and plot graphs

Module 4 :Python for Automation Testing (Optional Module)

Introduction to Automation Testing

- Introduction to testing.
- Testing concepts.
- Need of automation
- Types of automation Frameworks.
- UI Automation - Selenium Library

-Navigating

-Locating Elements

-Waits

Basics of APIs

Different types of APIs

API AUTOMATION - Request Module

Python UNIT TEST Framework

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- **Basic Test Structure**
- **Running Tests Cases**
- **Test Outcomes**
- **Types of Asserts statement**
- **Introduction to Test Fixtures**
- **Introduction to Test Suites**
- **Test Discovery with UNIT Test Framework**

Python Nose Framework

- Installation
- Running nose
- Nose fixtures
- Testing markdown.py
- Nose assert_equals
- Test discovery
- Running unittests from nose
- Running doctests from nose
- Integration of Nose with HTML

Python ROBOT Framework - RIDE

Introduction to Robot Framework

- Architecture
- Test Libraries
- Installation and Configuration of Robot Framework and Ride
- Suite Test Setup and Teardown

Tags: Tags for individual Testcases, Force Tags for Suite Level. Include or Exclude Tests or Suites based on the Tags

Reports & Logs – Creating reports with customized file names, Creating Reports with Specified Titles

Write Keywords in RF actually implemented in Python scripts

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Module 5 : Python for Web Development - Django (Optional Module)

Django Introduction, Installation and Setup

- Introduction to Django Framework
- Django Principles
- Install and create virtualenv
- Install Django and production ready setup.

Django Project, Concept and Demo

- Creating A New project
- Running the Development Server
- Django Apps
- URLs and Views
- URL Mapping -- emphasis on Python regex
- HTTP protocol Fundamentals
- Django Views -- render/HttpResponse Method
- Django Templates
- Static Files -- CSS, JavaScript and Images
- Model, Template and View (MTV) Design Pattern

Models in Detail

- Django Model Classes -- SQL Mapping
- Field Types
- Generating Databases
- SQL Queries
- Manage.py Database Commands
- Django Admin Interface -- superuser
- Implement `__str__` for your Model Classes

The Model API

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SAVE and Delete

Views and Templates in Detail

- Adding Login and Logout Views
- A template for the Home Page
- Authorization with Django
- Overview of all HTML Elements
- CSS Overview
- Templates: Tags and Variables
- Adding the HOME View
- URL Mapping for APPS
- Template Inheritance
- Login required -- Handling issues with Login using decorators
- Template Context
- Templates - For, Include

Forms in Detail

- Django Forms -- Model Class
 - Views and Forms
 - Templates and Forms -- csrf_token tag
 - Styling forms using django-crispy- forms
 - Verbose Name for display in forms
 - Help Text to show the text to help the user
 - Make a Field nullable -- null=True
 - Allow empty text Field -- blank=True
 - Showing Invitation
 - Accepting Invitation
 - Named Groups in URLs
 - Fat Models, skinny views
 - URLs: Reverse and get_absolute_url
 - Micro services, Rest API/Framework and Test Cases.
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- Micro-services, concept and architecture in detail.

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- Writing Micro-services.
- Rest Framework and API, concept.
- Writing Rest Services, sending and receiving JSON Data
- Writing Test Cases and Automated Testing Framework.
- Mini Projects
- Creating a complete User Profile and Home Page.
- Creating and Managing Poll Application.
- Tic-Tac- Toe Game.
- (Assignment and Live Examples)
- Sample resumes helping you to create your resume
- Hard copy study material
- Access to Dropbox and whatapp group of students

Python Programming

Duration: 2 hrs each session

Session :01

- Introduction to Python
- Scope in IOT
- Setting up environment
- Console I/O Operations

Session 02:

- Data Types, Variables, Literals
- Operators
- Control Structures

Session 03:

- Arrays
- String handling
- Regular expressions, pattern matching

Session 04:

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- Functions
- Lambda Functions

Session 05:

- File Handling
- Exception handling

Session 06:

- Modules
- Packages
- Building custom packages

Session 07:

- Data Structures in Python
- Standard Library
- Example library – OS

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