

## AI AND ML MASTER PROGRAMME

### INTRODUCTION

- ❖ Installation and Setting up path
- ❖ Features
- ❖ Python variables
- ❖ Input & Output and Import
- ❖ Why Learn Python
- ❖ Who used Python

### INTRODUCTION

- ❖ Using Pycharm & Scripting
- ❖ Keywords & Identifiers
- ❖ Operators, Indentations

### DATA TYPES

- ❖ Basic Data types: int, float, string, Boolean and Complex
- ❖ Numbers and String
- ❖ Tuple and List
- ❖ Dictionary and
- ❖ Set Arrays

### BUILT IN FUNCTIONS

- ❖ String, String slices
- ❖ Date
- ❖ Math
- ❖ Random and Statistics
- ❖ PDF Data Extraction
- ❖ CVS module

### TUPLES

- ❖ Introduction to Tuples
- ❖ Working with Tuples
- ❖ Tuple Operations
- ❖ Function and Methods

## LISTS

- ❖ Introduction to Lists
- ❖ Working with lists
- ❖ Lists Operations
- ❖ Function and Methods

## SETS

- ❖ Introduction to Sets
- ❖ Working with Sets
- ❖ Sets Operations
- ❖ Function and Methods

## FLOW CONTROL

- ❖ If...else
- ❖ Elif For,
- ❖ for else,
- ❖ while Break and Continue, Pass
- ❖ Looping Techniques

## FUNCTIONS

- ❖ Types of Functions
- ❖ Function Arguments
- ❖ Recursion
- ❖ Anonymous Function
- ❖ Global, local and Nonlocal
- ❖ Lambda Functions
- ❖ Modules
- ❖ Packages

## FILE HANDLING

- ❖ Reading & Writing Files
- ❖ Manipulating File Pointer
- ❖ Type of Files
- ❖ File Operations
- ❖ Directories
- ❖ File I/O Attributes, File Methods

## EXCEPTION HANDLING

- ❖ Try, Except and Finally
- ❖ Try else
- ❖ Custom Exception
- ❖ Error Vs. Exception

## OOPS CONCEPTS

- ❖ Real-time in OOPS
- ❖ Access Specifiers
- ❖ Class and Objects
- ❖ Methods
- ❖ Overloading and Overriding
- ❖ Inheritance
- ❖ Abstraction and Data Hiding
- ❖ Properties &Self-keyword

## OS AND SYSTEM SERVICES

- ❖ OS module
- ❖ Environment variables,
- ❖ Paths, directories, and filenames
- ❖ Working with file systems, Dates and times

## MULTITHREADING

- ❖ Starting a New Thread
- ❖ Creating Thread Using Threading Module
- ❖ Synchronizing Threads
- ❖ Multithreaded Priority Queue

## DATABASE CONNECTIVITY

- ❖ My SQL & Mongo Database Connection with Python
- ❖ CRUD
- ❖ Queries in MySQL

## XML and JSON

- ❖ Working with XML
- ❖ DOM and SAX introducing
- ❖ Parsing JSON into Python

## REGULAR EXPRESSION

- ❖ Pattern matching and searching
- ❖ Real time parsing of networking or system data using regex
- ❖ Validation Concepts

## TKINTER

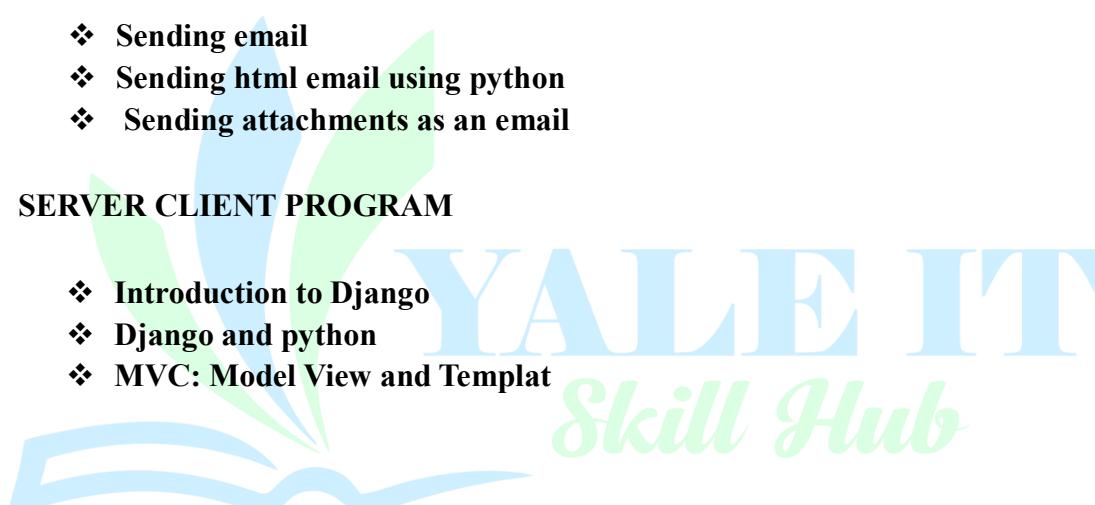
- ❖ Working with tkinter module
- ❖ Grid Positions
- ❖ Create Button
- ❖ Radio Button & Combo Box
- ❖ Check Box & Menu bar

## SMTP

- ❖ Sending email
- ❖ Sending html email using python
- ❖ Sending attachments as an email

## SERVER CLIENT PROGRAM

- ❖ Introduction to Django
- ❖ Django and python
- ❖ MVC: Model View and Templat



## PYTHON LIBRARIES

### NUMPY

- ❖ Numpy Introduction
- ❖ Numpy Arrays
- ❖ Data Types in Numpy
- ❖ Array Indexing
- ❖ Array Slicing
- ❖ Array Shape
- ❖ Array Reshape
- ❖ Array Iteration
- ❖ Array Join
- ❖ Array Split
- ❖ Array Search & Sorting
- ❖ Array Filte

### PANDAS

- ❖ Introduction
- ❖ Pandas Series
- ❖ Pandas Data Frames
- ❖ Pandas Read CSV & JSON
- ❖ Pandas Analyzing Data
- ❖ Data Cleaning

### MATPLOT LIBRARY

- ❖ Introduction
- ❖ Pyplot
- ❖ Plotting
- ❖ Markers
- ❖ Line
- ❖ Labels
- ❖ Grid
- ❖ Subplot
- ❖ Scatter
- ❖ Plot
- ❖ Bar
- ❖ Chart
- ❖ Histogram
- ❖ Pie Chart

## PANDAS ANALYZING DATA

- ❖ Dataset Information
- ❖ Description
- ❖ Dataset Unique & Missing Values
- ❖ Indexing, Plotting
- ❖ Separators,
- ❖ Converters
- ❖ Merge, Concat, Groupby, Pivot

## DATA SCIENCE

### DATA SCIENCE OVERVIEW

- ❖ Introduction about Data Science
- ❖ What is Data ?
- ❖ Database Table

### DATA FUNCTIONS

- ❖ Max Function
- ❖ Min Function
- ❖ Mean Function

### DATA SCIENCE MATH

- ❖ Linear Function
- ❖ Plotting Linear Function
- ❖ Slope and Intercept

### DATA SCIENCE STATISTICS

- ❖ Introduction in Statistics
- ❖ Standard Deviation
- ❖ Variance

## STATISTICS CORRELATION

- ❖ Correlation Coefficient
- ❖ Correlation Matrix Statistics
- ❖ Correlation vs Causality

## EDA

- ❖ Descriptive statistics
- ❖ Grouping of Data
- ❖ Handling Missing Values in dataset
- ❖ Analysis of Variance
- ❖ Correlation

## MACHINE LEARNING

### MACHINE LEARNING OVERVIEW

- ❖ Introduction about Machine Learning
- ❖ Data Set in ML
- ❖ Data Types in ML

### MACHINE LEARNING STATISTICS

- ❖ Median
- ❖ Mode
- ❖ Percentile

## DATA DISTRIBUTION

- ❖ Big Data Distribution
- ❖ Normal Data Distribution

## SUPERVISED LEARNING MODEL

- ❖ Linear Regression
- ❖ Decision Tree
- ❖ Naïve Bayes
- ❖ Random Forest
- ❖ K-Nearest Neighbors
- ❖ Support Vector Machine
- ❖ Logistic Regression
- ❖ Polynomial Regression
- ❖ Multiple Regression
- ❖ Scale
- ❖ Grid Search

## DATA ANALYSIS

- ❖ Decision Tree
- ❖ Confusion Matrix
- ❖ Categorical Data
- ❖ Bootstrap Aggregation
- ❖ Cross Validation
- ❖ Natural Language Processing

## DATA VISUALIZATION

- ❖ Train or Test Method
- ❖ Hierarchical Clustering
- ❖ K-Means Method
- ❖ AUC-ROC Curve



## TABLEAU

## INTRODUCTION

- ❖ BI Concepts
- ❖ What is TABLEAU? Why Data Visualization?
- ❖ Unique Features compared to Traditional BI Tools
- ❖ TABLEAU Overview & Architecture
- ❖ File Types & Extensions

## DATA CONNECTIONS IN TABLEAU INTERFACE

- ❖ Data Connections in the Tableau Interface
- ❖ Connecting to Tableau Data Server
- ❖ Types of Join
- ❖ When to Use Joining
- ❖ What is Data Blending
- ❖ When to Use Data Blending
- ❖ Joining vs. Blending
- ❖ Creating Data Extracts in Tableau
- ❖ Shadow Extracts
- ❖ Prepare your Data for Analysis

## ORGANIZING AND SIMPLIFYING DATA

- ❖ Filters. Applying Filters
- ❖ Quick Filters
- ❖ Sorting of Data
- ❖ Creating Combined Fields
- ❖ Creating Groups and Defining Aliases
- ❖ Working with Sets and Combined Sets
- ❖ Drill to Other Levels in a Hierarchy
- ❖ Grand totals and Subtotals
- ❖ Tableau Bins
- ❖ Fixed Sized Bins
- ❖ Variable Sized Bins
- ❖ Creating and using Parameters
- ❖ Exploring Parameter Controls
- ❖ Using parameters for titles, field selections, logic statements, Top X
- ❖ Cross Tabs [Pivot Tables]
- ❖ Page Trials Total and Sub-Total

## BUILDING CHART TYPES

- ❖ Working with Combined Axis
- ❖ Working with Combination Charts
- ❖ Working with Geocoding and Geographic Mapping
- ❖ Using Scatter Plots
- ❖ Using Text tables and Highlight tables

- ❖ Using Heat Maps
- ❖ Using Histograms
- ❖ Using Pie Charts
- ❖ Using Bullet Charts

## ADVANCED CHART TYPES

- ❖ Using Pareto Charts
- ❖ Using Waterfall Charts
- ❖ Using Gantt Charts
- ❖ Using Box Plots
- ❖ Using Sparkline Charts
- ❖ Using Density Charts
- ❖ Using KPI Charts
- ❖ Small Multiples Working with aggregate versus disaggregate data
- ❖ What is Market Basket Analysis
- ❖ Performing Market Basket Analysis

## LOGIC STATEMENTS

- ❖ Formatting
- ❖ Options in Formatting Visualizations
- ❖ Working with Labels and Annotations
- ❖ Effective Use of Titles and Captions
- ❖ Introduction to Visual Best Practices

## MAPPING

- ❖ Importing and Modifying Custom Geocoding
- ❖ Working with Symbol Map and Filled Map
- ❖ Using Background Image
- ❖ Exploring Geographic Search
- ❖ Perform Pan Zoom Lasso and Radial Selection
- ❖ Working with WMS Server Maps [Web Map Service]

## STATISTICS

- ❖ Add Reference Lines Bands and Distribution
- ❖ Adding Reference Lines
- ❖ Adding Reference Bands
- ❖ Adding Reference Distribution
- ❖ Working Reference Lines Bands and Forecasting
- ❖ Trend lines and Trend Models

## DASHBOARD

- ❖ Build Interactive Dashboards
- ❖ Best practices for creating effective dashboards
- ❖ Creating a Dashboard and Importing Sheets
- ❖ Interaction Exploring Dashboard Actions
- ❖ Use of Running Actions & Dashboard Actions
- ❖ How to Share your Reports & Exporting your Work

## INTRODUCTION

- ❖ What is Power BI
- ❖ Why we have to use?

## ARCHITECTURE

- ❖ Components

## POWER BI



## SUPPORTED DATA SOURCES

- ❖ Data Sources

## COMPARISON WITH OTHER BI TOOLS

- ❖ Power BI vs Tableau

## DATA MODELLING

- ❖ Using Data Modeling and Navigation
- ❖ Creating Calculated Columns
- ❖ Creating Calculated Tables
- ❖ Managing Time-Based Data

## DASHBOARD OPTIONS

- ❖ Exploring Different Datasets
- ❖ Creating and Sharing Dashboards
- ❖ Tiles in Dashboard
- ❖ Data Gateway

## VISUALIZATION OPTIONS

- ❖ Creating Simple Visualizations
- ❖ Creating Map Visualizations
- ❖ Using Combination Charts
- ❖ Using Tables
- ❖ Modify Colours in Charts
- ❖ Adding Shapes, Images and Text box
- ❖ Styling Reports
- ❖ Duplicating Reports

## EXCEL INTEGRATION

- ❖ Using Excel Data
- ❖ Importing xlsx Files

## DASHBOARDS

- ❖ Using Power BI Desktop for Report Sharing
- ❖ Printing Power BI Dashboards
- ❖ Export Options
- ❖ Publishing Report to Web
- ❖ Using & Editing
- ❖ Content Pack

## DAX BASICS IN POWER BI

- ❖ DAX Architecture, Entity Sets
- ❖ DAX Data Types, Syntax Rules
- ❖ DAX Measures and Calculation
- ❖ Data Modeling Options in DAX

## ADMINISTRATION ROLE

- ❖ Purchasing
- ❖ REST API
- ❖ Security

## ADVANCED EXCEL

### INTRODUCTION

- ❖ FORMULAS & FUNCTIONS
- ❖ Aggregate Function & Logical Function
- ❖ Lookup & References
- ❖ Financial Functions
- ❖ Formatting and Proofing

### CONDITIONAL FORMATTING

- ❖ Conditional Formatting using New Rule
- ❖ Conditional Formatting using Formula

### PIVOT TABLES

- ❖ Creating Simple Pivot Tables
- ❖ Basic and Advanced Value Field Setting
- ❖ Calculated Field & Calculated Items
- ❖ Grouping based on numbers and Dates

### POWER PIVOT

- ❖ Activating Power pivot
- ❖ Usage of Data model
- ❖ DAX Calculation
- ❖ Relational Data

### SLICERS AND CHARTS

- ❖ Using SLICERS, Filter data with Slicers
- ❖ Various Charts i.e. Bar Charts/Pie Charts/Line Charts
- ❖ Manage Primary and Secondary Axis

### DATA AND VALIDATION

- ❖ Number, Date & Time Validation
- ❖ Text and List Validation
- ❖ Custom Validation
- ❖ Dropdown List Validation

## ANALYZING AND ORGANIZING DATA

- ❖ Creating Scenarios
- ❖ Working with Data Tables
- ❖ Using Goal Seek
- ❖ Using Solver
- ❖ Using Consolidating Data by Position or Category
- ❖ Consolidating Data Using Formulas Excel

## VBA MS ACCESS

- ❖ Macro Builder
- ❖ Create a standalone macro
- ❖ Create an embedded macro
- ❖ Add actions to a macro
- ❖ Control program flow with If, Else If, and Else
- ❖ Create sub macros
- ❖ Group related actions together
- ❖ Expand and collapse macro actions or blocks
- ❖ Copy and paste macro actions
- ❖ Share a macro with others

## INTRODUCTION

- ❖ Get started with database, SQL and MySQL
- ❖ What is database?
- ❖ Why use SQL?
- ❖ Importance of MySQL

## BASICS OF SQL

- ❖ First Steps in SQL
- ❖ Creating a database
- ❖ Introduction to data types
- ❖ Creating a table

## INSTALLING SQL

- ❖ Get acquainted with the interface

## SQL SERVER LANGUAGES AND RELATIONAL DATABASES

- ❖ DDL
- ❖ DCL
- ❖ DML
- ❖ TCL

## RELATIONAL DATABASE TERMINOLOGY

- ❖ Relational Database essentials
- ❖ Primary key
- ❖ Foreign key
- ❖ Unique key and null values

## THE SELECT STATEMENT

- ❖ Load the database
- ❖ Loading employees' database
- ❖ Starting with SELECT statement
- ❖ Select-From Where
- ❖ And-Or (In-not in)
- ❖ Like-not like Wildcard characters0
- ❖ Between-and
- ❖ Is not null-is null Select distinct
- ❖ Aggregate statement Order by-Group by
- ❖ Using Aliases
- ❖ Having and Limit

## SQL STATEMENT

- ❖ Insert statement
- ❖ Inserting data INTO table
- ❖ Update statement Commit and rollback
- ❖ Delete statement
- ❖ Drop vs Truncate
- ❖ AGGREGATE FUNCTIONS
- ❖ Functions
- ❖ Count
- ❖ Sum
- ❖ Min() and Max
- ❖ Avg
- ❖ Round()



## MAPPED CERTIFICATIONS

- ❖ PCEP-30-xx
- ❖ PCAP-31-xx
- ❖ PCPP-32-1xx
- ❖ PCPP-32-2xx

## EXIT PROFILE

- ❖ Data Analyst
- ❖ Data Scientist
- ❖ Data Architect
- ❖ Business Intelligence Developer
- ❖ Machine Learning Scientist
- ❖ Back-end Developer
- ❖ Quality Assurance Engineer

