

AI AND ML MASTER PROGRAMME

INTRODUCTION

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

NTRODUCTION

- ❖ 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 Filter

PANDAS

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

MATPLOTLIB

- ❖ 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**

POWER BI

INTRODUCTION

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

ARCHITECTURE

- ❖ **Components**

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**

SQL

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 characters**
- ❖ **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

