PEA
PETROLEUM ENGINEERS ASSOCIATION

ACCREDITED

5 Days Online Training On

Applied Machine Learning for Production Engineering

Nashat Jumaah Omar

SCAN TO JOIN PEA COMMUNITY

REGISTRATION OPEN!

REGISTER NOW!

Reach out to us at

ZOOM

+91 6205464268/
+91 70194 95792

www.peassociations.com

ABOUT THIS TRAINING

- Our intensive Machine Learning training for reservoir engineering domain will covers all the basics about ML implementation in production engineering and production monitoring with hands on project to implement the typical ML tasks: Clustering, Time Production Analysis, Regression, Classifications.

- This training is designed by an oil and gas professional for professionals likewise, where real oil and gas data are used in the training with diversity in data sets.

SKILLS GAINED

- Get started with Python and Machine Learning
- Learn Basics of Python as an ML tool
- Data Manipulation, Filtering, visualization and processing.
- Machine Learning Implementation
- Work with actual Oil and Gas Data
- Learn from an instructor with 11 years' experience in programming, technology and Upstream Industry.

AUDIENCE

- Reservoir Engineers.
- Production engineers.
- Chemical engineers.
- Drilling engineers.
- Geologists and petrophysics
- AL and workover engineers.
- Undergraduate students.

PREREQUISITE

- No knowledge is required.
- A working laptop with Windows 10 OS, MacOS or GNU Linux Distro

WHAT YOU WILL GET FROM JOINING

- Access to Video Recordings on daily basis.
- Study materials ppt, pdf
- Many Oil and Gas Datasets.
- Learn Python through anaconda package

DAY 1

TOPICS

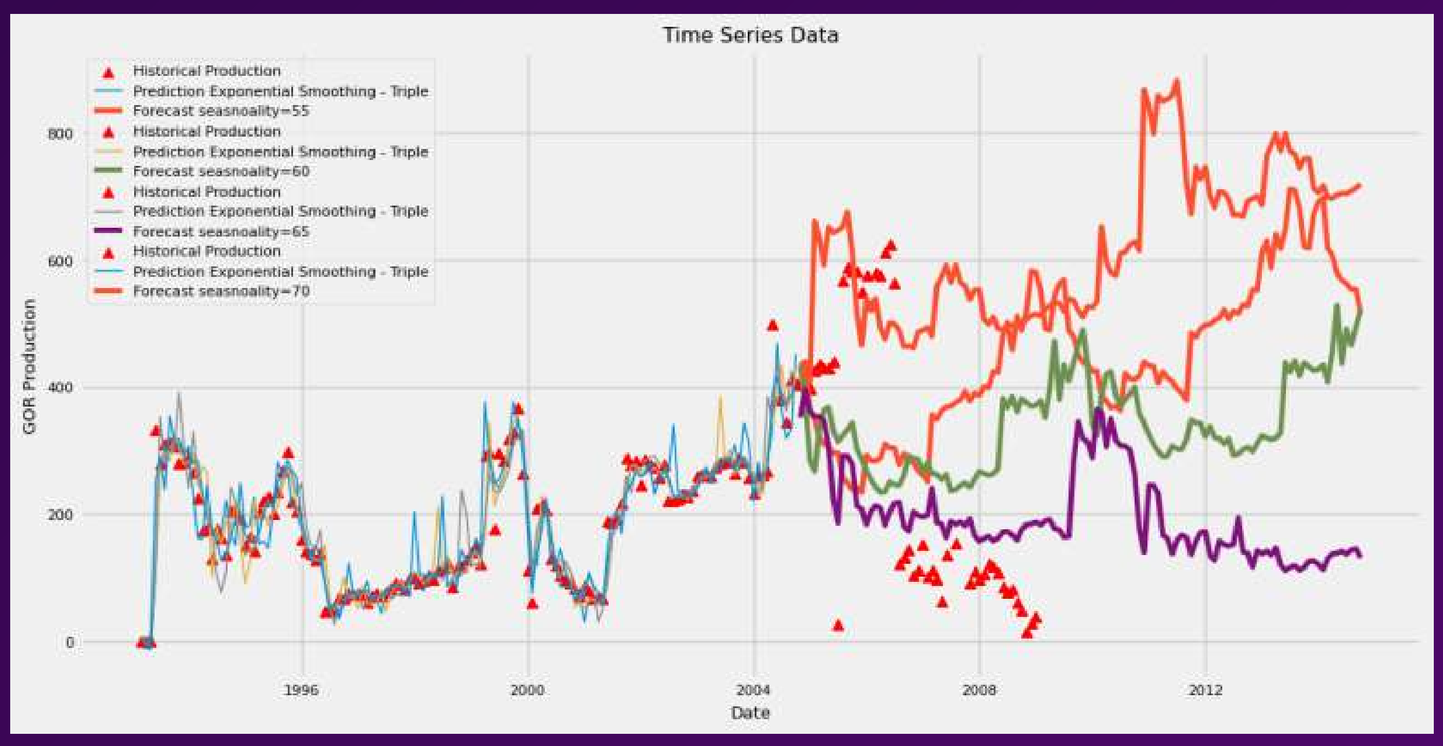
- A gentle introduction to Python Programming Language
- Data types and Structures in Python
- Introduction to Data Visualization
- Working with Tabulated Data using Pandas
- Basics of Data Cleaning and Transformation using Pandas.
- Creating Calculations and Data Exports.
- Linking Excel, CSV, TXT to Python

EXERCISES

- Oil and Gas Data Reading and excel connection to python
- Simple Reservoir Data Visualization.
- Filtering Reservoir Data based on Wells (single or Multiple)
- Cleaning and organizing historical data, with proper datetime conversion.

WHAT YOU WILL LEARN

- Understand the Basics of Python Programming: Gain a foundational understanding of the Python programming language, including its syntax, structure, and common uses.
- Navigate the Python Environment and Ecosystem: Familiarize yourself with the Python environment, including IDEs, libraries, and tools that form the Python ecosystem.
- Identify and Utilize Python Data Types and Structures: Learn to work with various data types and structures in Python, such as lists, dictionaries, tuples, and sets, for efficient data management.



DAY 2

TOPICS

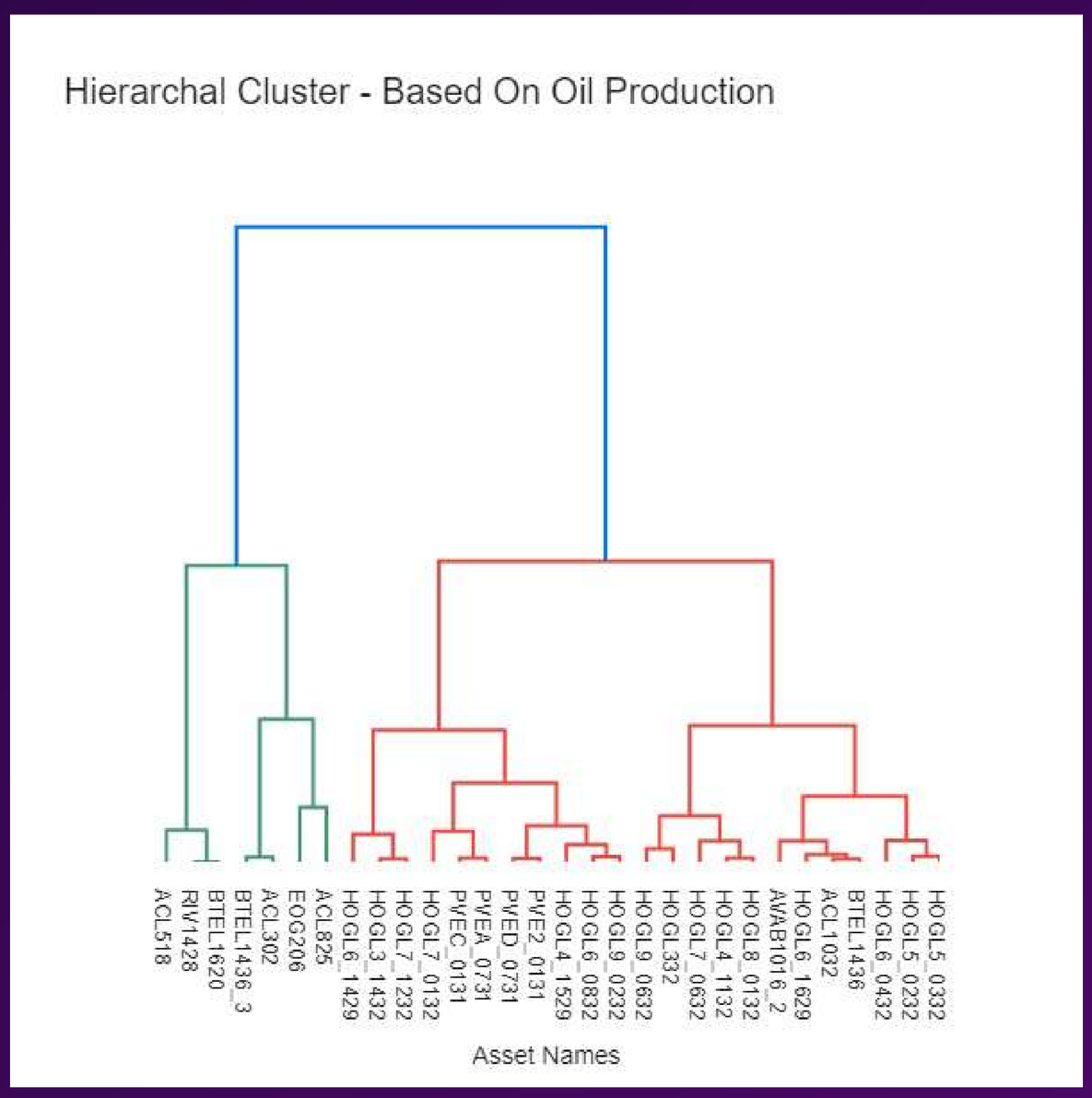
- Introduction to the Concept of Clustering
- Understanding Distance Metrics
- Introduction to the Scikit-Learn Library for Machine Learning
- Anomaly Detection Techniques

EXERCISES

- Clustering Water Production Data.
- Detecting Anomaly in Production Data

WHAT YOU WILL LEARN

- Gain an understanding of clustering as a powerful unsupervised machine learning technique, and how to group similar data points together.
- Explore various distance metrics such as Euclidean, Manhattan, and Cosine distances, and their importance in clustering and other machine learning algorithms.
- Learn to utilize the Scikit-Learn library to implement machine learning algorithms efficiently in Python.



DAY 3

TOPICS

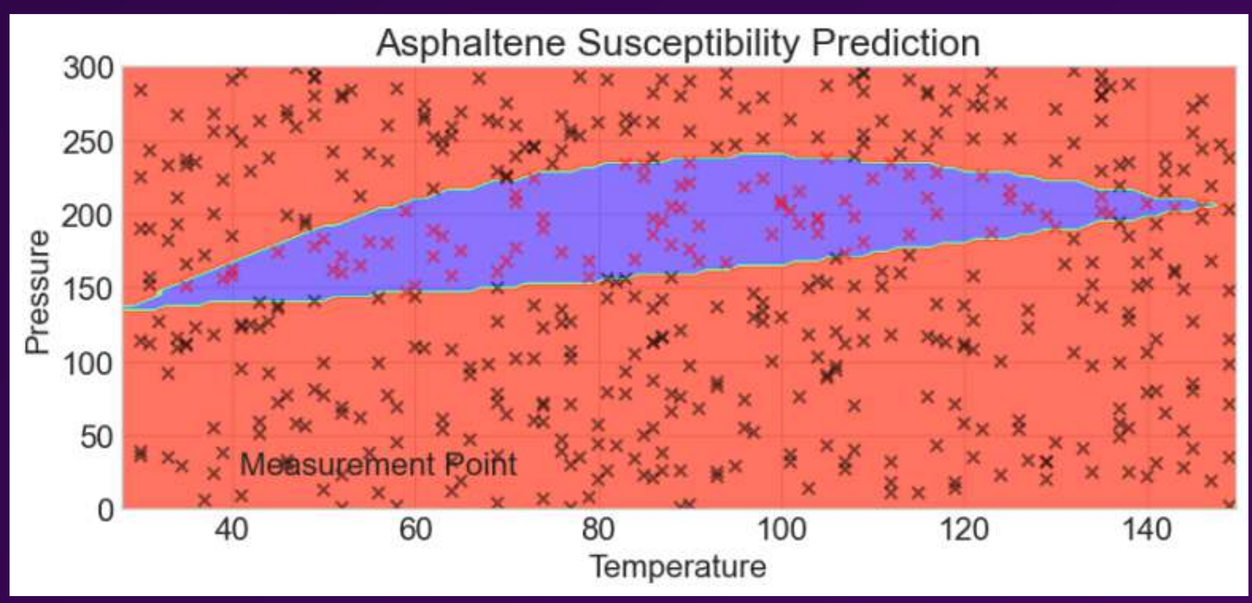
- Introduction to the Concept of classification
- Voting and Decision Trees
- Introduction to KNN method
- Introduction to the Decision Tree and Random Forest Methods
- Python Plotting Techniques

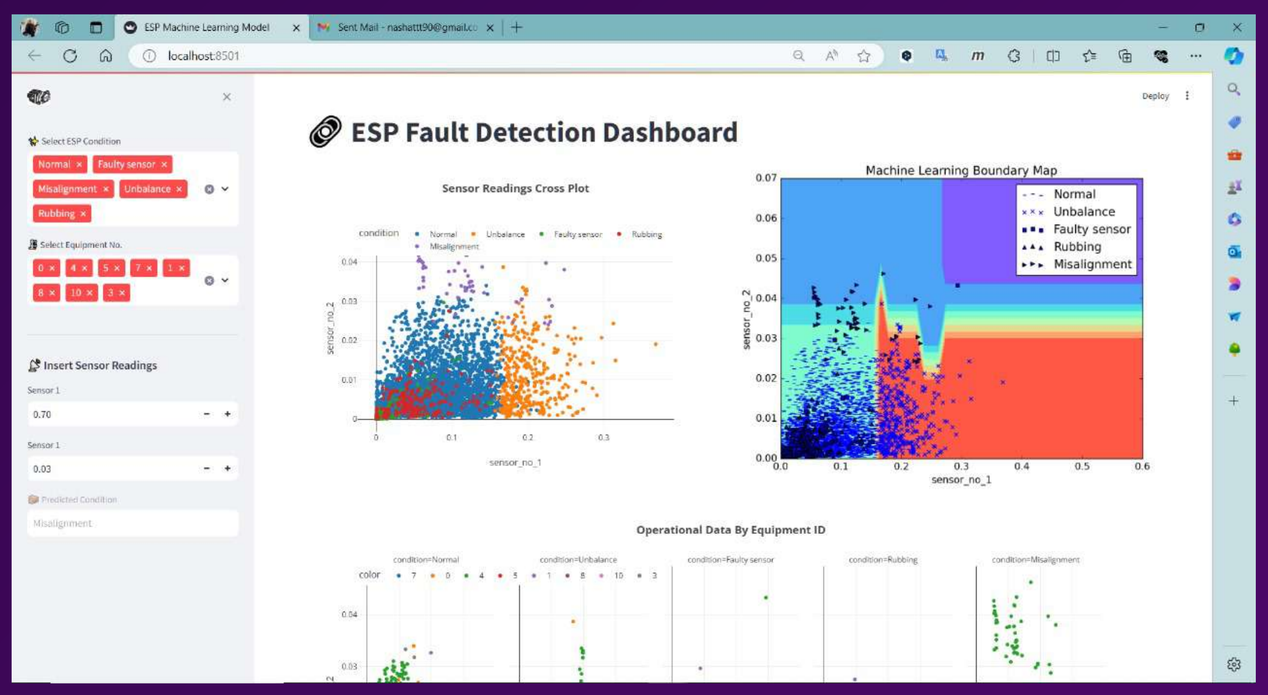
EXERCISES

- Classifying ESP Operational Problems.
- Predicting Flow Regime Type

WHAT YOU WILL LEARN

- Understand the role of labels and events in the oil and gas industry, and how they influence data-driven decision-making.
- Learn the fundamentals of labeled data and how classification models use these labels to predict outcomes.
- Explore decision trees and their related algorithms, and how they are used in machine learning to make decisions based on data.





DAY 4

TOPICS

- Introduction to Continuous Data and Corresponding Relationships
- Relationship Visualization and Correlation Matrix
- Introduction to Regression Analysis
- Linear Regression Fundamentals
- Support Vector Regression (SVR)
- Xtreme Gradient Regression (XGBoost Library)

EXERCISES

- Training ML to Behave like PROSPER software
- Predicting Hydrocarbon Properties using ML

WHAT YOU WILL LEARN

- Understand continuous data and how it differs from categorical data, as well as the relationships that can be formed between continuous variables.
- Learn how to visualize relationships between variables using various plots and generate correlation matrices to understand variable interdependencies.
- Explore regression analysis as a key technique for modeling relationships between variables and predicting continuous outcomes.
- Gain a deep understanding of linear regression, its assumptions, and how it is used to fit straight-line relationships between variables.
- Learn how to implement Support Vector Regression (SVR), a powerful algorithm for dealing with both linear and non-linear relationships in data.
- Discover the XGBoost library for performing extreme gradient boosting, a highly efficient and accurate machine learning algorithm for regression and classification tasks.

DAY 5

TOPICS

- Introduction to Time-Bounded Data in the Oil and Gas Industry
- Understanding Typical Decline Curve Analysis (DCA) and Its Limitations
- Introduction to Time Series Analysis (TSA)
- Short-Term Production Prediction Using Time Series Analysis
- Simple Moving Average (SMA) and Exponential Moving Average (EMA)
- Introduction to Autoregressive (AR) Models

EXERCISES

- Predicting Shale Production Decline using Auto Regression Models.
- Predicting Water Cut Based on WHP, Qo, Qg

WHAT YOU WILL LEARN

- Understand the concept of time-bounded data in the oil and gas industry and its importance for production and reservoir analysis.
- Learn the fundamentals of Decline Curve Analysis (DCA), a traditional tool in oil and gas, and explore its limitations when predicting long-term production.
- Dive into Time Series Analysis (TSA), a modern approach to handling temporal data, and learn how it differs from DCA.
- Recognize patterns and components in time series data, such as trends, seasonality, and cycles, and how these components influence predictions.
- Predicting future values in a time series based on its past behavior.