



GUVI

Capstone Project 5

Industrial Copper Modeling

Using Python scripting, Data Preprocessing, EDA, Streamlit

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Project Overview

The objective of this project is to leverage advanced machine learning techniques to address key challenges in the copper industry, such as pricing optimization and lead evaluation. The solution focuses on:

Data-Driven Insights: Analyzing and preprocessing historical data to identify patterns, manage skewness, and handle noisy datasets for improved predictions.

Regression Model: Predicting the selling price of copper products based on key parameters such as quantity, thickness, and other product attributes to support dynamic pricing strategies.

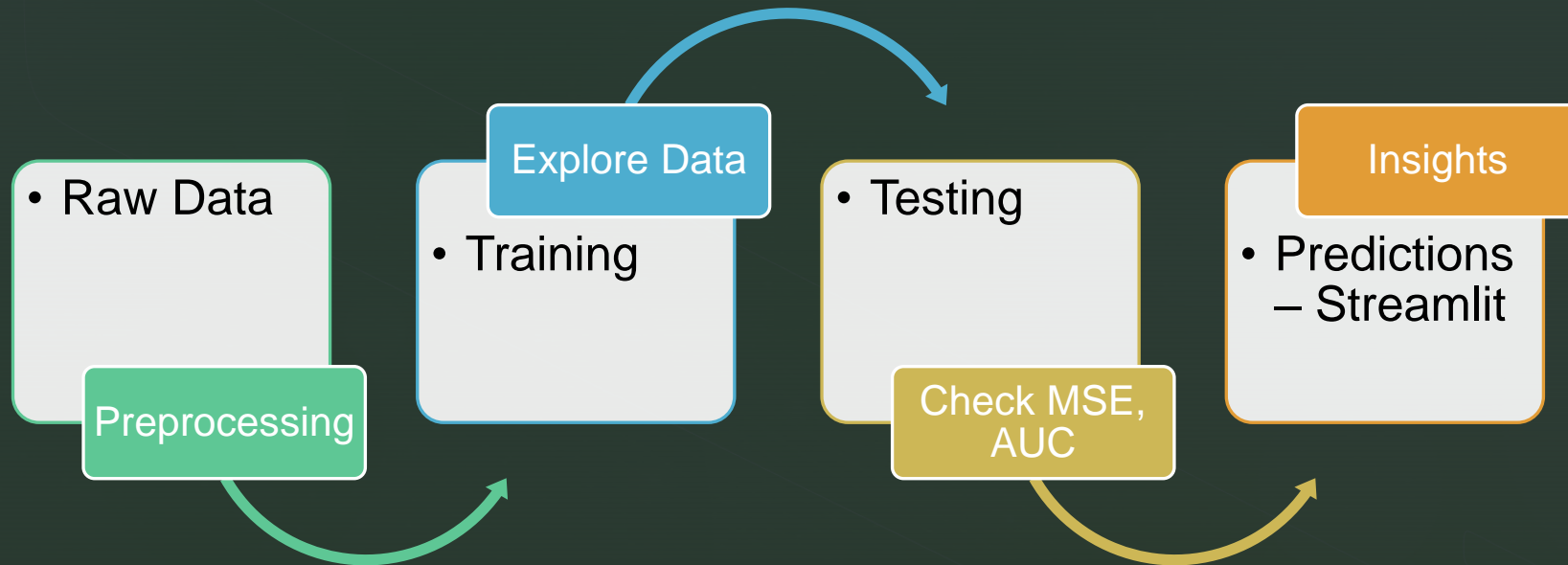
Classification Model: Classifying leads into "WON" or "LOST" categories using transactional and customer data, enabling better sales pipeline management.

Streamlit Application: Developing an interactive web-based application for real-time prediction and decision-making, providing a user-friendly interface for entering input features and obtaining actionable predictions.

Streamlined Workflows: Incorporating data preprocessing, feature engineering, and visualization techniques to ensure robust model performance and accurate predictions.

Project Workflow

User Interface (UI): Streamlit App Codes



System Requirements

- Visual Studio Code Version: 1.85.1 or later
- ML libraries
- Streamlit App

Note: Install or register the above tools to execute the project.

PIP Installations

- `pip install pandas`
- `pip install streamlit`
- `pip install streamlit-option-menu`
- `pip install numpy`
- `pip install scikit-learn`
- `pip install matplotlib`
- `pip install seaborn`
- `pip install openpyxl`
- `pip install joblib`
- `pip install xlrd`
- `pip install xgboost`
- `pip install watchdog`

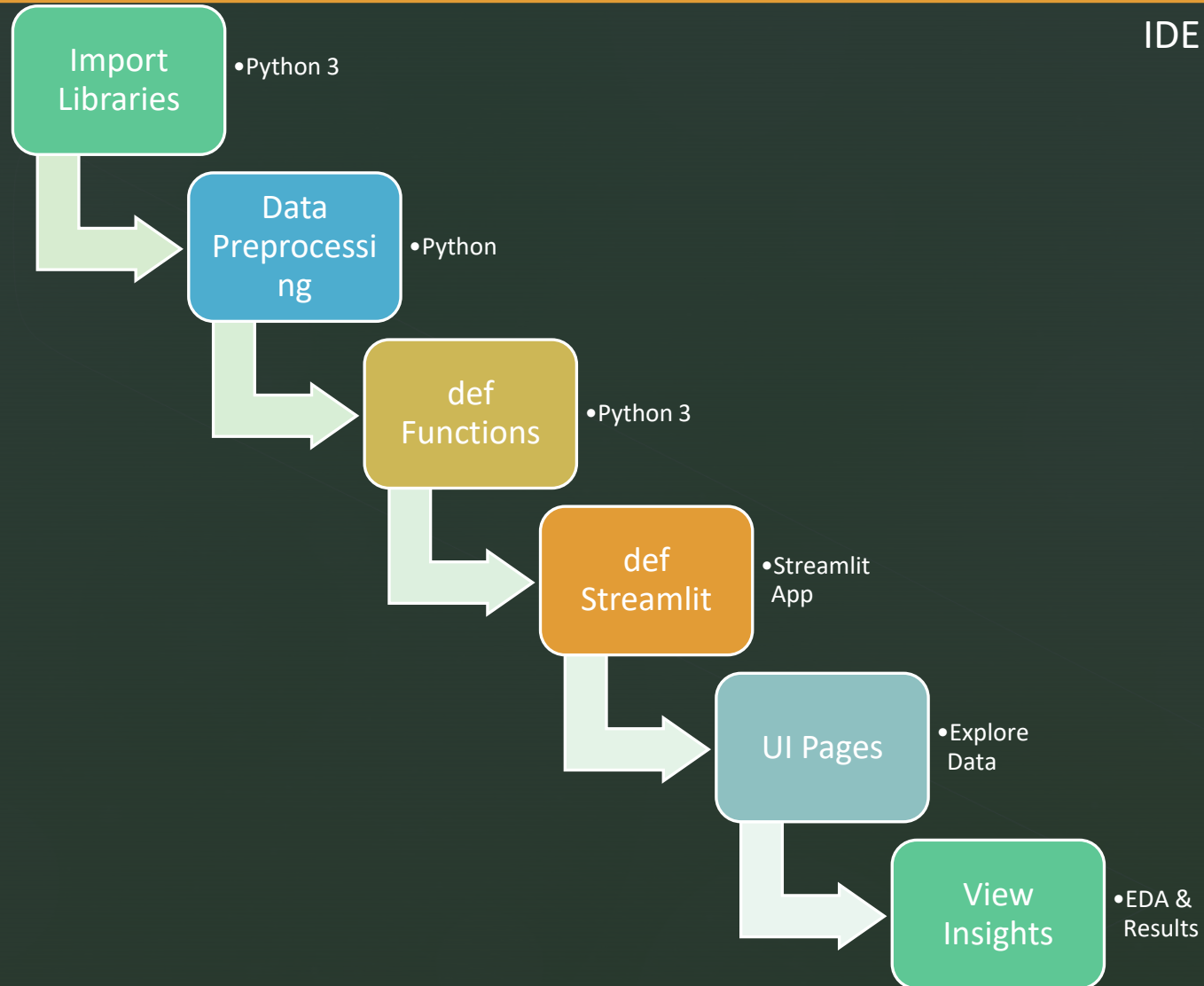
Note: Install the above pip in respective IDE terminal (Eg: VS Code terminal or Run in cmd for Windows)


▀ Coding References

- [GITHUB Repositories](#)
- [Guvi Classes](#)
- [Streamlit Documentation](#)

Coding Flow

IDE: Visual Studio Code





Annexure: Screenshots

irgicmstfinal.py > ...

```
1  import pandas as pd
2  import numpy as np
3  import os
4  import pickle
5  import streamlit as st
6  from sklearn.model_selection import train_test_split, GridSearchCV
7  from sklearn.ensemble import RandomForestRegressor, RandomForestClassifier
8  from sklearn.metrics import mean_squared_error, classification_report, roc_auc_score
9  from sklearn.preprocessing import StandardScaler
10
11  # Load data function
12  def load_data(file):
13      |   return pd.read_excel(file)
14
15  # Preprocess data function
16  def preprocess_data(df, task):
```

PROBLEMS 56 OUTPUT DEBUG CONSOLE TERMINAL PORTS JUPYTER

Python + ▾ □ 🗑️ ⋮ ^ ×

Warning: to view this Streamlit app on a browser, run it with the following command:

```
streamlit run c:/Users/Rajaguru Irusan/Documents/DS_Project/Industrial Copper Modeling_Project/Python_Code/irgicmstfinal.py [ARGUMENTS]
```



```
c:\Users\Rajaguru Irusan\Documents\DS_Project\Industrial Copper Modeling_Project\Python_Code>streamlit run irgicmstfinal.py
```

You can now view your Streamlit app in your browser.

Local URL: <http://localhost:8501>

Network URL: <http://192.168.1.3:8501>

▀ Thank You!!!