Phase 4 : AI-Driven Exploration and Prediction of

company

import pandas as pd

import matplotlib.pyplot as plt

from sklearn.model\_selection import train\_test\_split

from sklearn.metrics import mean\_squared\_error

import numpy as np

data = pd.read\_csv('Data\_Gov\_Tamil\_Nadu.csv')

data['CORPORATE\_IDENTIFICATION\_NUMBER'] = pd.to\_datetime(data['CORPORATE\_IDENTIFICATION\_NUMBER'])

data.set\_index('CORPORATE\_IDENTIFICATION\_NUMBER', inplace=True)

result = seasonal\_decompose(data['Registrations'], model='additive')

result.plot()

plt.show()

train\_size = int(len(data) \* 0.8)

train, test = data.iloc[:train\_size], data.iloc[train\_size:]

model = ExponentialSmoothing(train, seasonal='add', seasonal\_periods=12)

model\_fit = model.fit(optimized=True, use\_brute=True)

forecast = model\_fit.forecast(len(test))

mse = mean\_squared\_error(test, forecast)

rmse = np.sqrt(mse)

print("Root Mean Squared Error: {rmse}")

plt.plot(train, label='Training Data')

plt.plot(test, label='Testing Data')

plt.plot(forecast, label='Forecast')

plt.legend()

plt.show()