

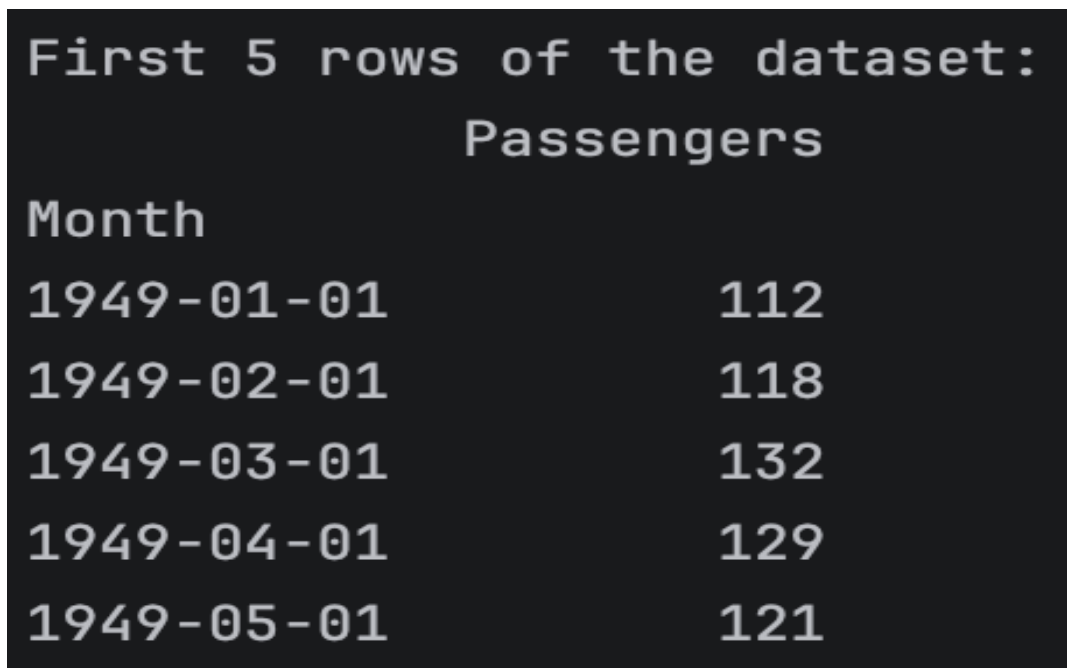
Time Series Forecasting Using Python

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This project demonstrates time series analysis and forecasting using Python. The dataset represents monthly airline passenger counts, which is analyzed to identify trends, seasonality, and future forecasts.

Dataset Preview

Below screenshot shows the first few rows of the dataset used in this project.

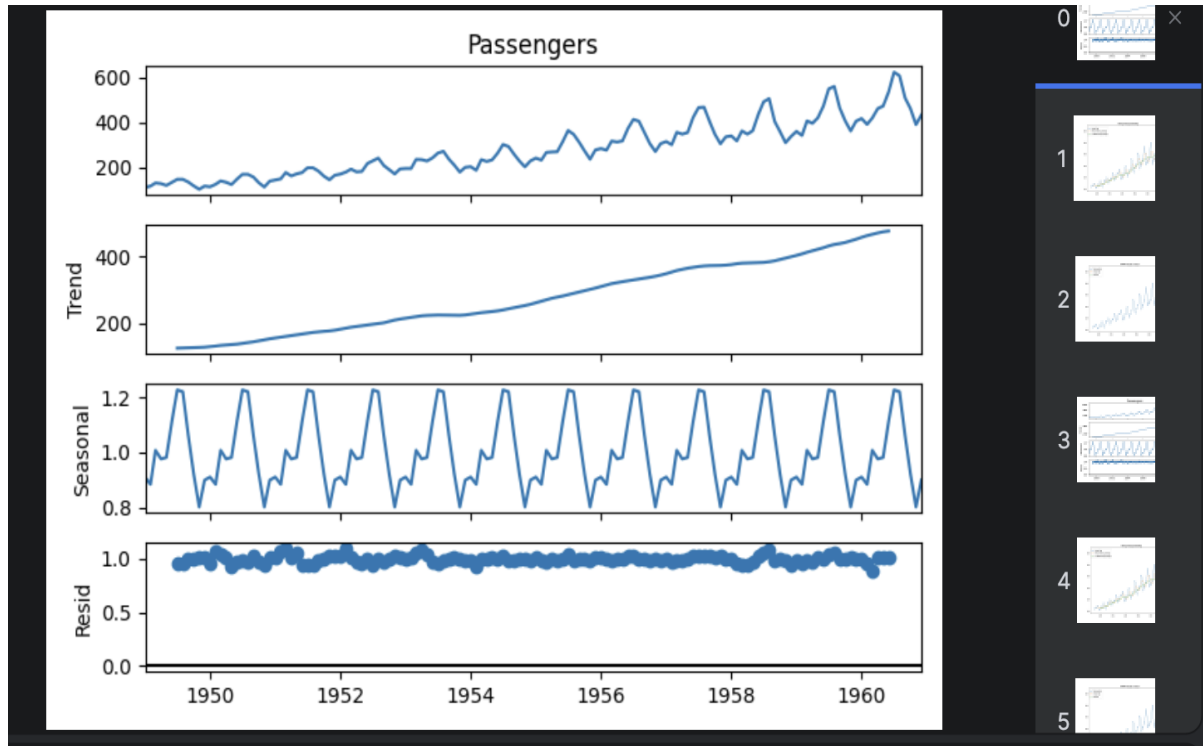


The screenshot displays a table with two columns: 'Month' and 'Passengers'. It shows the first five rows of data, starting from January 1949. The passenger counts are 112, 118, 132, 129, and 121 for the respective months.

First 5 rows of the dataset:	
Passengers	
Month	
1949-01-01	112
1949-02-01	118
1949-03-01	132
1949-04-01	129
1949-05-01	121

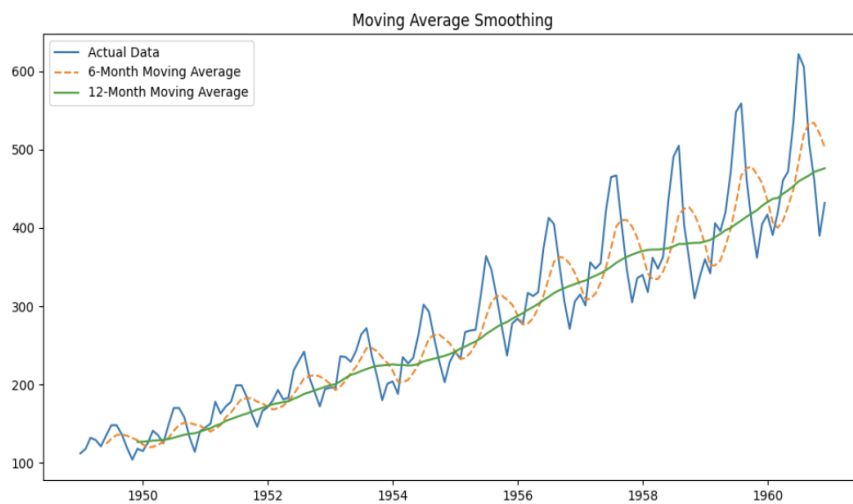
Time Series Decomposition

The time series is decomposed into Trend, Seasonal, and Residual components to better understand underlying patterns.



Moving Average Smoothing

Moving average smoothing is applied to reduce short-term fluctuations and highlight long-term trends.



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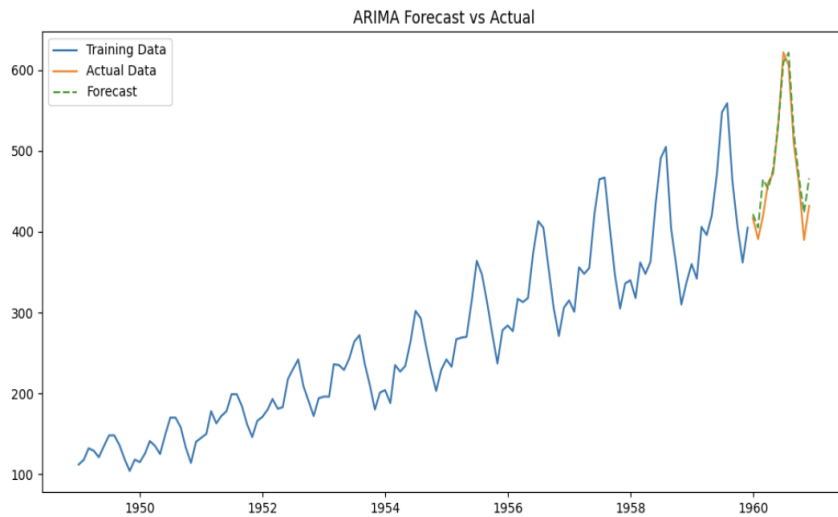


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ARIMA Forecasting

An ARIMA model is used to forecast future passenger values. The plot compares training data, actual values, and predicted forecasts.



Conclusion

This project successfully demonstrates time series forecasting using Python. The ARIMA model captures trend and seasonality effectively, making it useful for real-world forecasting problems.