

# 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.

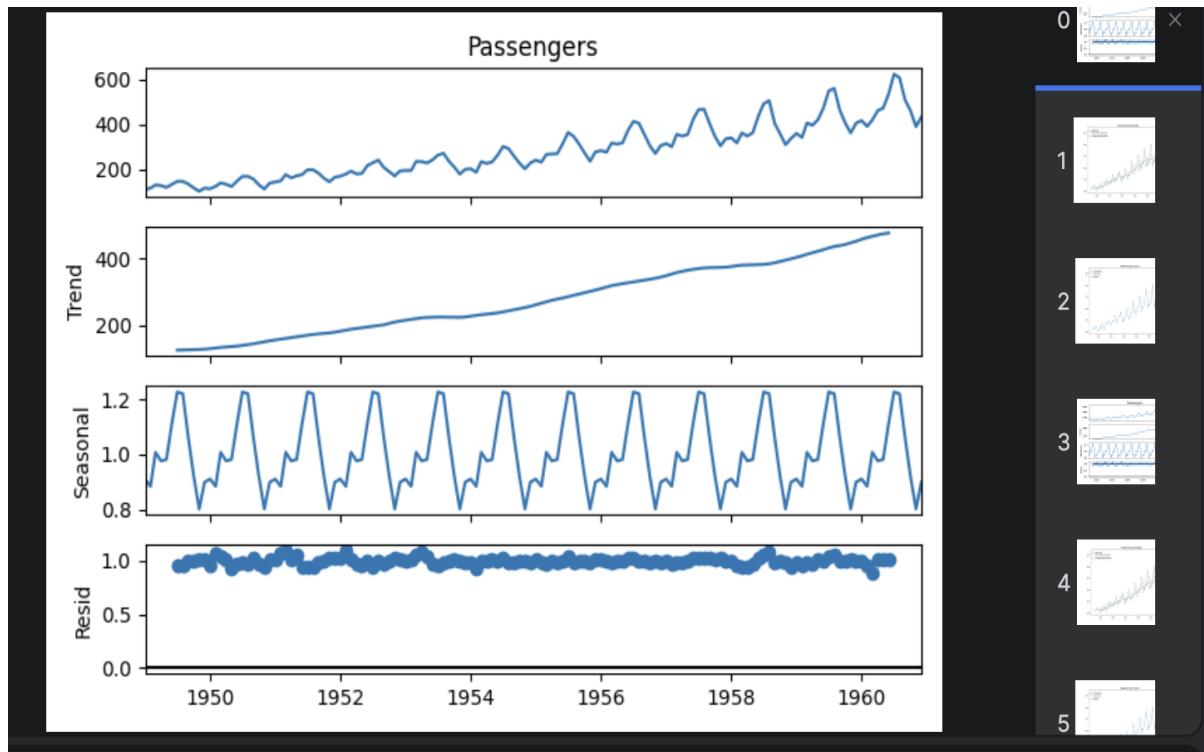
## Dataset Preview

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

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

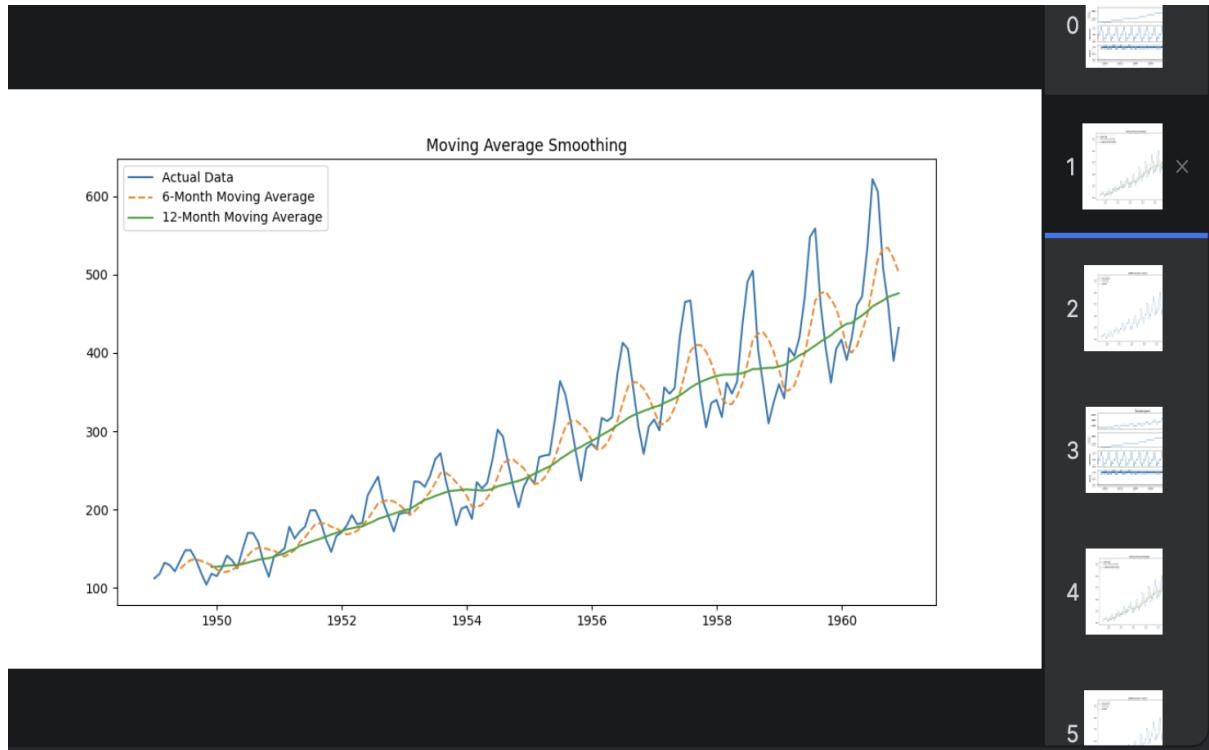
## Time Series Decomposition

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



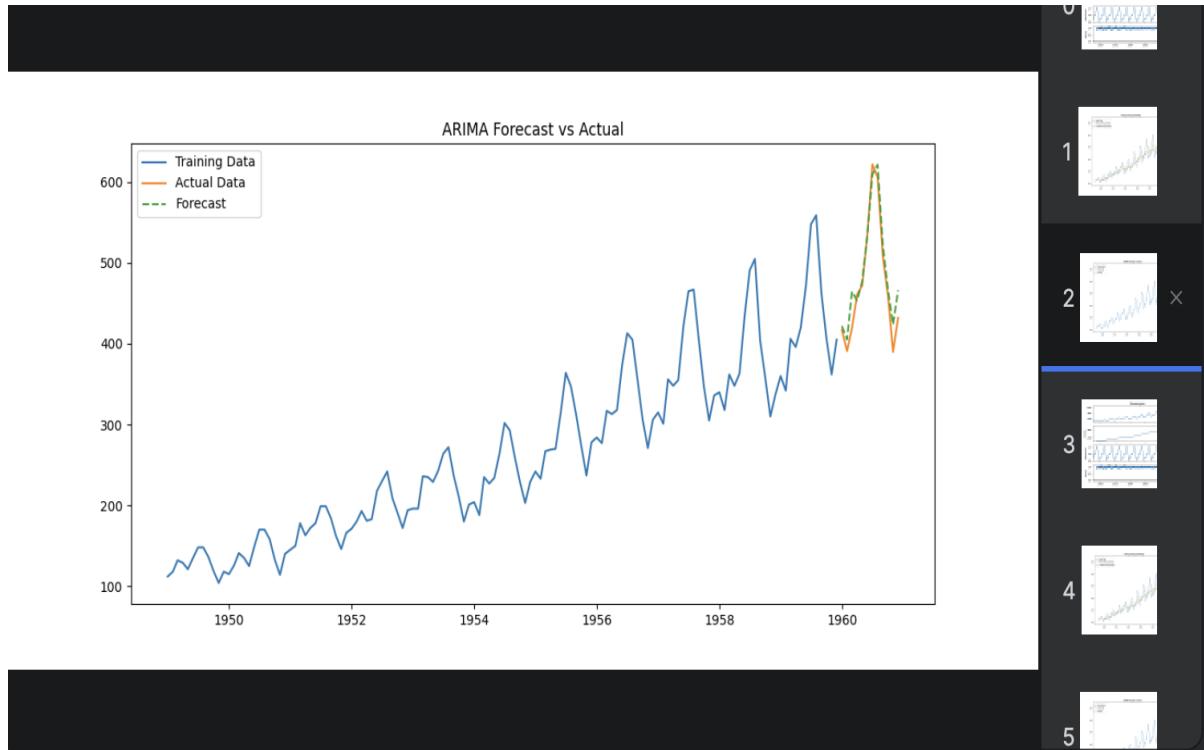
## Moving Average Smoothing

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



## 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.