

# Time Series Forecasting Tool User Guide

This tool allows you to upload your time series data and perform various forecasting methods to predict future values. This user guide will walk you through the steps to effectively use the tool.

## Uploading Data

- Click on the "Upload CSV file" button.
- Select the CSV file containing your time series data.
- After uploading, the tool will display a preview of your data, and you will be prompted to select the date column and value column from your dataset.

## Choosing Forecasting Method

- Select the forecasting method from the dropdown menu. The available methods include Moving Average, Simple Exponential Smoothing, Exponential Smoothing, ARIMA, SARIMA, and STL.
- Adjust the number of steps ahead to forecast using the slider. This determines how many future time periods you want to predict.

## Performing Forecasting

- Click on the "Perform Forecasting" button to generate forecasts based on your chosen method and parameters.
- The tool will display the forecasted values along with error measures such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE).
- A plot showing the historical and forecasted values will be displayed for visual analysis.

## Downloading Forecasted Values

- After generating forecasts, you can download the forecasted values as a CSV file by clicking on the "Download Forecasted Values CSV File" link.
- The downloaded file will contain the forecasted values along with their corresponding timestamps.

Here are detailed descriptions of each forecasting method:

1. **Moving Average Forecasting:** Calculates the simple moving average forecast. This method takes the average of the last 'n' observed values to make predictions for the next 'n' periods.
2. **Exponential Smoothing Forecasting:** Uses the Holt-Winters method for forecasting. This method models the time series data using three components: level, trend, and seasonality. It provides robust forecasts for data with trends and seasonality.
3. **ARIMA Forecasting:** Utilizes the AutoRegressive Integrated Moving Average model for forecasting. ARIMA is a widely used method for time series forecasting. It models the time series data as a combination of autoregressive (AR) and moving average (MA) components.
4. **SARIMA Forecasting:** Applies Seasonal AutoRegressive Integrated Moving Average model for forecasting. SARIMA extends ARIMA to account for seasonality in the data. It includes seasonal AR and MA terms to capture repeating patterns in the time series.

### **Additional Resources:**

**User Guide:** Download the complete user guide for detailed instructions and tips on using the Time Series Forecasting Tool.

**Sample Data:** Download a sample CSV file containing example time series data to practice using the tool.

For further assistance or customization requests, contact the developer via email at [mpailden@gmail.com](mailto:mpailden@gmail.com) or via Viber/WhatsApp at +639278665190.