

Forex Rate Prediction Application - User Manual

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Introduction

The Forex Rate Prediction Application is a machine learning-powered tool designed to help predict currency exchange rates based on historical data. This application uses time series forecasting algorithms to analyze patterns in currency rate movements and provide predictions for future rates.

This manual provides instructions on how to use the application effectively.

Getting Started

Accessing the Application

1. Open your web browser and navigate to the application URL: <http://localhost:3001>
2. The home page displays the Forex Rate Prediction interface.
3. The application consists of several key components:
 - Model information card
 - Prediction form
 - Results section
 - Historical trend chart
 - ML Pipeline visualization (accessible via navigation)

Understanding the Interface

- **Model Information Card:** Displays details about the current model being used, including its version, creation date, and performance metrics.
- **Prediction Form:** Where you input data and parameters for prediction.

- **Results Section:** Displays prediction results when available.
- **Historical Trend Chart:** Visualizes historical and predicted rates.
- **ML Pipeline Visualization:** Shows the data processing and model training pipeline.

Making Predictions

Follow these steps to make a prediction:

1. **Select Currency Pair:**
 - Choose the currency pair you want to predict from the dropdown menu (e.g., USD/INR, EUR/USD, GBP/USD).
2. **Enter Input Sequence:**
 - In the "Input Sequence" text area, enter historical exchange rates as comma-separated values.
 - Example: 83.25, 83.36, 83.48, 83.55, 83.60
 - Enter at least 5 recent values for best results.
3. **Set Prediction Horizon:**
 - Specify how many days ahead you want to predict (1-7 days).
 - Shorter horizons generally yield more accurate predictions.
4. **Submit Prediction:**
 - Click the "Predict Rate" button to submit your request.
 - A loading spinner will appear while the prediction is being processed.

Understanding Results

After submission, the prediction results will appear in the Results section:

1. **Predicted Value:**
 - The central predicted value for the exchange rate.
2. **Confidence Interval:**
 - Lower Bound: The lower limit of the prediction interval
 - Upper Bound: The upper limit of the prediction interval
 - These bounds represent the range where the actual value is likely to fall.
3. **Historical Trend Chart:**
 - The chart will automatically update to include your new prediction.
 - This provides a visual representation of historical rates and the predicted value.

ML Pipeline Visualization

To access the ML Pipeline visualization:

1. Navigate to the ML Pipeline section using the navigation menu.
2. Here you can explore: a. **Pipeline Overview:**

- Visual representation of the data processing and model training pipeline stages
- Status indicators showing the current state of each stage
- 3. b. **Runs & Status:**
 - History of pipeline executions
 - Status of each run (completed, failed, running)
 - Error messages for failed runs
 - Duration and performance metrics
- 4. c. **Performance Metrics:**
 - Data processing metrics (records processed, processing time, throughput)
 - Model training metrics (training time, iterations, convergence)

Troubleshooting

Common Issues and Solutions

1. **"Invalid sequence format" Error:**
 - Ensure your input sequence contains only numbers separated by commas.
 - Remove any letters, special characters, or spaces (except commas between numbers).
2. **No Prediction Results:**
 - Check your internet connection.
 - Verify that the sequence has sufficient data points (minimum 5 recommended).
 - Try refreshing the page and submitting again.
3. **Chart Not Updating:**
 - Try refreshing the browser page.
 - Clear browser cache and try again.
4. **"Failed to fetch model information" Error:**
 - The backend service might be incomplete. Will need to update the application.