Final Project Report

Project Title: Exchange Rate Tracker
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Course: Advanced Python
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Introduction

In a globalized economy, staying updated with currency exchange rates is essential for both individuals and businesses. This project, titled **"Exchange Rate Tracker"**, aims to create a user-friendly desktop application that enables users to view live exchange rates, convert currencies, and manage a list of favorite currencies with ease. The goal is to enhance user accessibility to exchange rate data with a modern and intuitive interface.

Technologies Used

The application was developed using the following tools and technologies:

- **Python 3**: Core programming language.
- **Tkinter**: For designing the graphical user interface (GUI).
- **ttk (Themed Tkinter Widgets)**: For a more modern UI appearance.
- **Requests Library**: To fetch real-time exchange rate data from an API.
- **ExchangeRate-API**: A free and reliable API providing currency conversion data.
- **datetime Module**: To format and display the last updated timestamp.

Implementation Details

The application follows a modular structure using **Object-Oriented Programming (OOP)** principles. The main class, ExchangeApp, encapsulates all core functionalities including:

1. Live Exchange Rate Viewer

- Utilizes a Treeview widget to display all available exchange rates with base currency as USD.
- Automatically fetches and refreshes data using the API: https://api.exchangerate-api.com/v4/latest/USD.

2. Currency Converter

- Accepts user input for amount, source currency, and target currency.
- Performs accurate conversion using the formula: converted=amount×(ratetoratefrom)\text{converted} = \text{amount} \times \left(\frac{\text{rate}_{\text{to}}}{\text{rate}_{\text{from}}} \right)converted=amount×(ratefromrateto)

3. Favorites Section

- Users can add/remove their preferred currencies.
- Favorite rates are displayed in a dedicated text area.

4. GUI Design

- Uses a modern color palette and font styling to improve readability and user experience.
- Responsive layout supports resizing.

Challenges & Solutions

Challenge	Solution
API Errors or Connection Failures	Implemented try-except blocks with user-friendly error messages via messagebox.
Combobox values not updating	Ensured dynamic updating of currency list after API refresh.
Responsive UI Design	Used pack() and grid() methods strategically along with padding and column configuration.
Validating User Input	Added checks for currency code length, existence in the API response, and numeric input validation.

Conclusion & Future Work

This project successfully delivers a functional and visually modern currency tracker application. It allows users to:

- Access real-time exchange rates
- Convert currencies with high accuracy
- Maintain a personalized list of favorite currencies

Future Improvements:

- **Historical Data Visualization:** Add charts to show past trends.
- **Multi-language Support:** Enable localization for international users.
- **Dark Mode Option:** Offer theme switching for better accessibility.
- **Offline Mode with Cached Rates:** Allow recent data usage without internet.

References

- https://www.exchangerate-api.com
- Python Official Documentation
- Tkinter & ttk Widget Guides