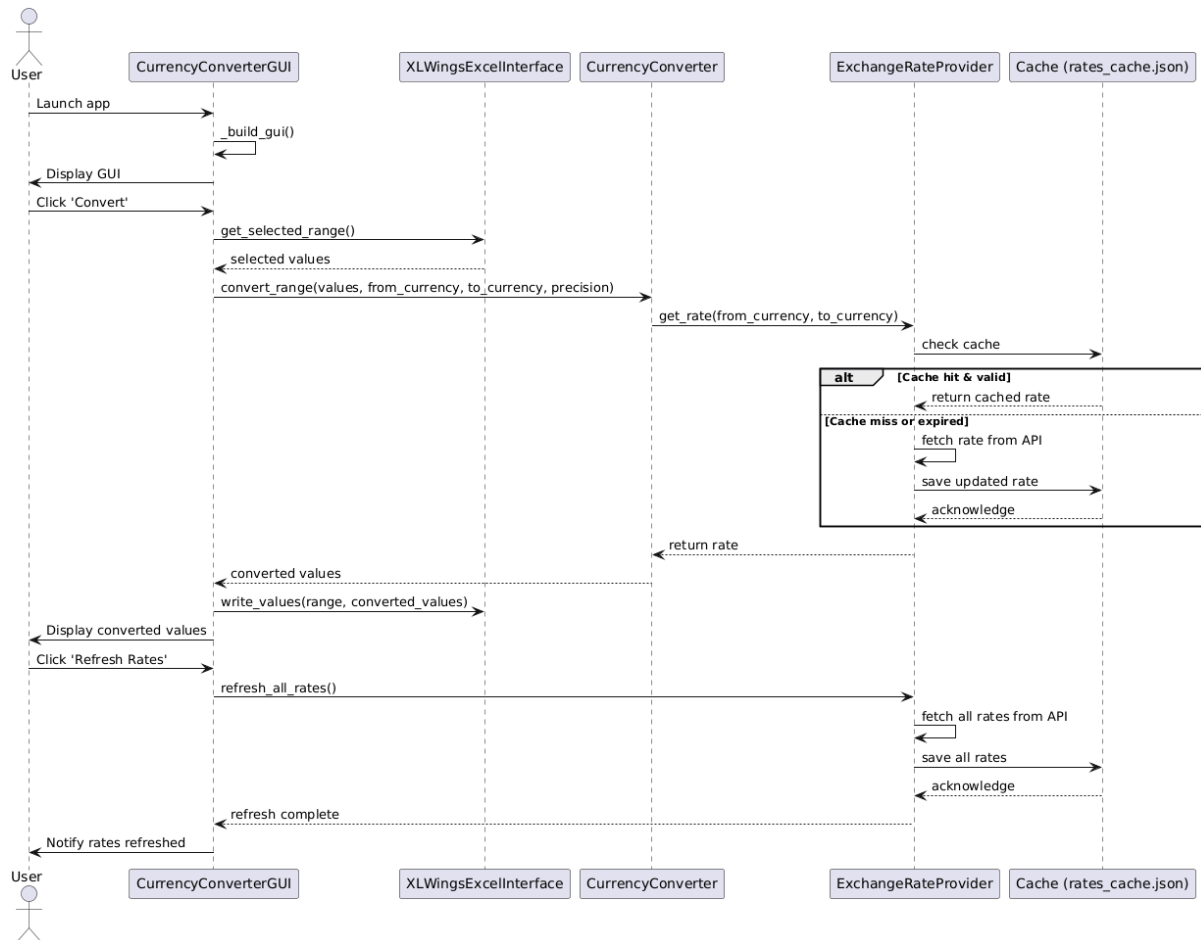


Excel Exchange

This project is a **real-time currency converter** integrated with **Microsoft Excel**, enabling users to convert selected cells containing monetary values between different currencies. It supports **offline caching** and **live rate updates**, making conversions fast, reliable, and resilient to API downtime.



Features & Implementation

1. GUI Interface

- **Technology:** Tkinter
- **Functionality:** Provides a simple, interactive interface for selecting Excel ranges, specifying source/target currencies, and performing conversions.
- **Benefit:** Easy for non-technical users to operate.

2. Excel Integration

- **Technology:** xlwings
- **Functionality:** Reads selected cells from Excel and writes converted values back.
- **Benefit:** Seamless integration with spreadsheets without manual copy-pasting.

3. Currency Conversion Logic

- **Technology:** Python (CurrencyConverter class)

- **Functionality:** Converts values using live exchange rates, with configurable decimal precision.
- **Benefit:** Accurate conversions with flexible formatting.
- 4. **Exchange Rate Retrieval**
 - **Technology:** `requests` (for API calls) + `json` (for cache)
 - **Functionality:** Fetches live rates from an online API and stores them in `rates_cache.json`.
 - **Benefit:** Reduces redundant API calls and improves performance.
- 5. **Offline Cache**
 - **Technology:** `JSON` file (`rates_cache.json`)
 - **Functionality:** Caches exchange rates with a **2-hour TTL** to allow offline conversions.
 - **Benefit:** Ensures conversions work even when the API is temporarily unavailable.
- 6. **Logging**
 - **Technology:** `logging` module (`currency_converter.log`)
 - **Functionality:** Tracks conversion operations and errors for troubleshooting.
 - **Benefit:** Helps maintain transparency and debug issues efficiently.

Usage

1. Launch the GUI.
2. Select the Excel range to convert.
3. Choose source and target currencies.
4. Click **Convert** to update the selected cells.
5. Optionally, click **Refresh Rates** to fetch the latest rates and update the cache.

Key Advantages:

- Real-time conversion with Excel integration.
- Offline support with caching.
- Easy-to-use GUI for non-technical users.
- Reliable logging and error handling.