# CURRENCY CONVERTER

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## Purpose

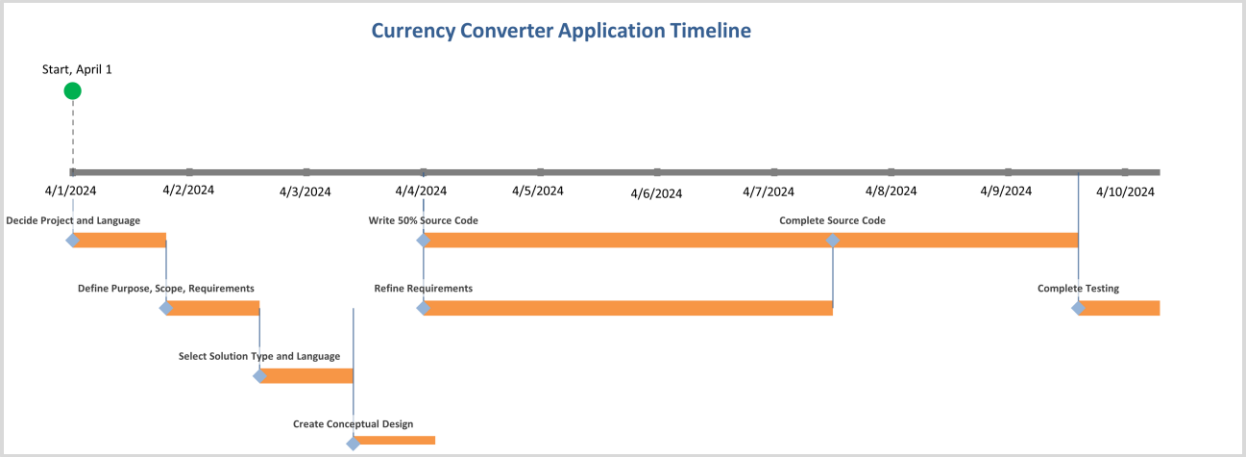
The Currency Converter Application will allow users to select two currencies and enter an amount for conversion. The application will fetch the latest exchange rates from a reliable online source and perform the conversion calculations accordingly.

## Timeline

The timeline chart, below, shows project tasks and major project milestones. The blue extending from each point shows how much time has been allocated for task completion.

## Status

As at the time of reporting the project is tracking to the timeline.




## Requirements

This project includes the following types of requirements, technology, business, user, and non-functional. The requirements traceability matrix, below, is used to track requirements fulfillment and requirements testing results.

## Traceability Matrix

| Requ't Number | Requ't Name | Category | Test Criteria | Expected Result | Result | Pass/Fail | Notes |
|---|---|---|---|---|---|---|---|
| **TR-01** | Python Implementation | Technology | Implement core functionality in Python | Application logic implemented successfully | N/A | N/A | N/A |
| **TR-02** | Currency Conversion Library | Technology | Utilize a currency conversion library to fetch exchange | Latest exchange rates fetched successfully | N/A | N/A | N/A |

| Requ't Number | Requ't Name | Category | Test Criteria | Expected Result | Result | Pass/Fail | Notes |
|---|---|---|---|---|---|---|---|
| | | | rates from a reliable online source | | | | |
| **TR-03** | User Interface | Technology | Design user-friendly interface for currency selection | Intuitive interface for currency selection | N/A | N/A | N/A |
| **TR-04** | Currency Conversion Calculation | Technology | Implement currency conversion calculation logic | Correct conversion calculation | N/A | N/A | N/A |
| **TR-05** | Display Conversion Results | Technology | Display converted amount to the user | Accurate display of converted amount | N/A | N/A | N/A |
| **BR-01** | Reliable Exchange Rate Source | Business | Ensure the CurrencyConverter library fetches exchange rates from a reliable online source | Exchange rates sourced from the CurrencyConverter library | N/A | N/A | N/A |
| **BR-02** | User Interface Simplicity | Business | Ensure the user interface is simple and intuitive | Easy-to-use interface for all users | N/A | N/A | N/A |
| **UR-01** | Currency Selection Options | User | Provide users with options to select different currencies | Wide range of currency options available | N/A | N/A | N/A |
| **UR-02** | Real-time Exchange Rates | User | Fetch real-time exchange rates for accurate conversion | Exchange rates updated in real-time | N/A | N/A | N/A |
| **NF-01** | Application Performance | Non-Functional | Ensure application performance is optimal | Application runs smoothly without delays | N/A | N/A | N/A |

## Solutions Comparison and Selection

The following two types of solutions are compared, a desktop application and a web application. Based on the comparison, the preferred solution is identified.

### Solution 1 - Desktop Application

This solution entails hosting the application on a user's desktop, allowing them to access it at any time.

a. Accessibility: Users can access the application directly from their desktop, providing convenience.

b. Scalability: The project can be efficiently managed and maintained by a single developer.

### Solution 2 – Web Application

This solution entails creating a web-based application accessible through a browser. Important aspects and requirements include:

a. Hosting Costs: Payment of a recurring fee is necessary for domain name hosting.

b. Technical Requirements: Requires an online database and an enterprise-level IDE for dynamic webpage design.

c. Personnel Requirement: Additional team members are needed for front-end development and networking, with a lead developer managing backend functionalities.

### Selection

Solution 1, the Desktop Application, is preferred for the Currency Converter Application due to the following reasons:

Compatibility and Scalability: It offers compatibility across various operating systems and scalability for future updates and enhancements.

Cost Control: Hosting costs are avoided, and development is simplified with a straightforward codebase.

User Convenience: Users can directly access the application from their desktop, enhancing usability and convenience.

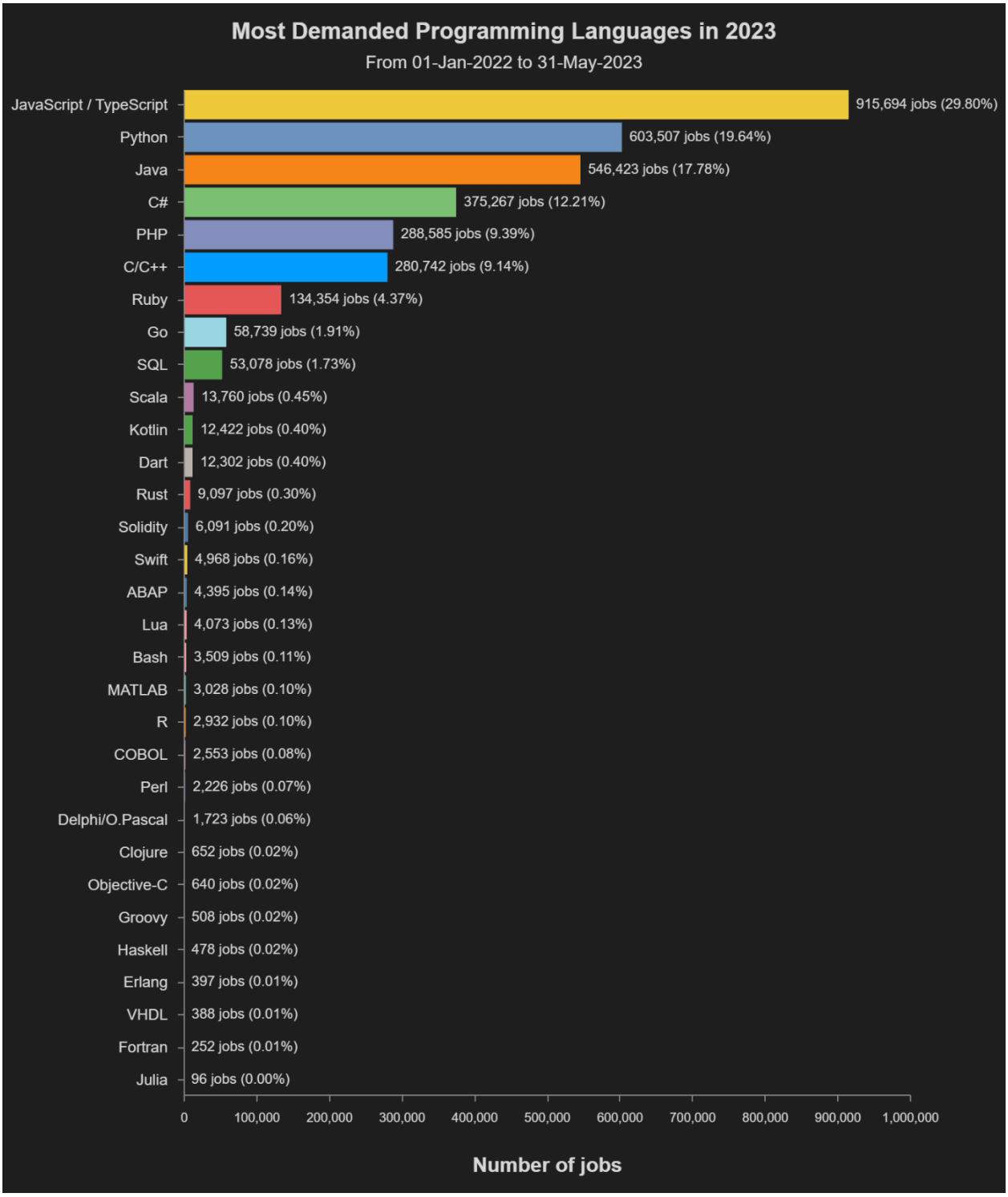
Given these factors, Solution 1 provides the highest level of compatibility, scalability, and user convenience, aligning well with the objectives of the project.

### Programming Languages Comparison and Selection

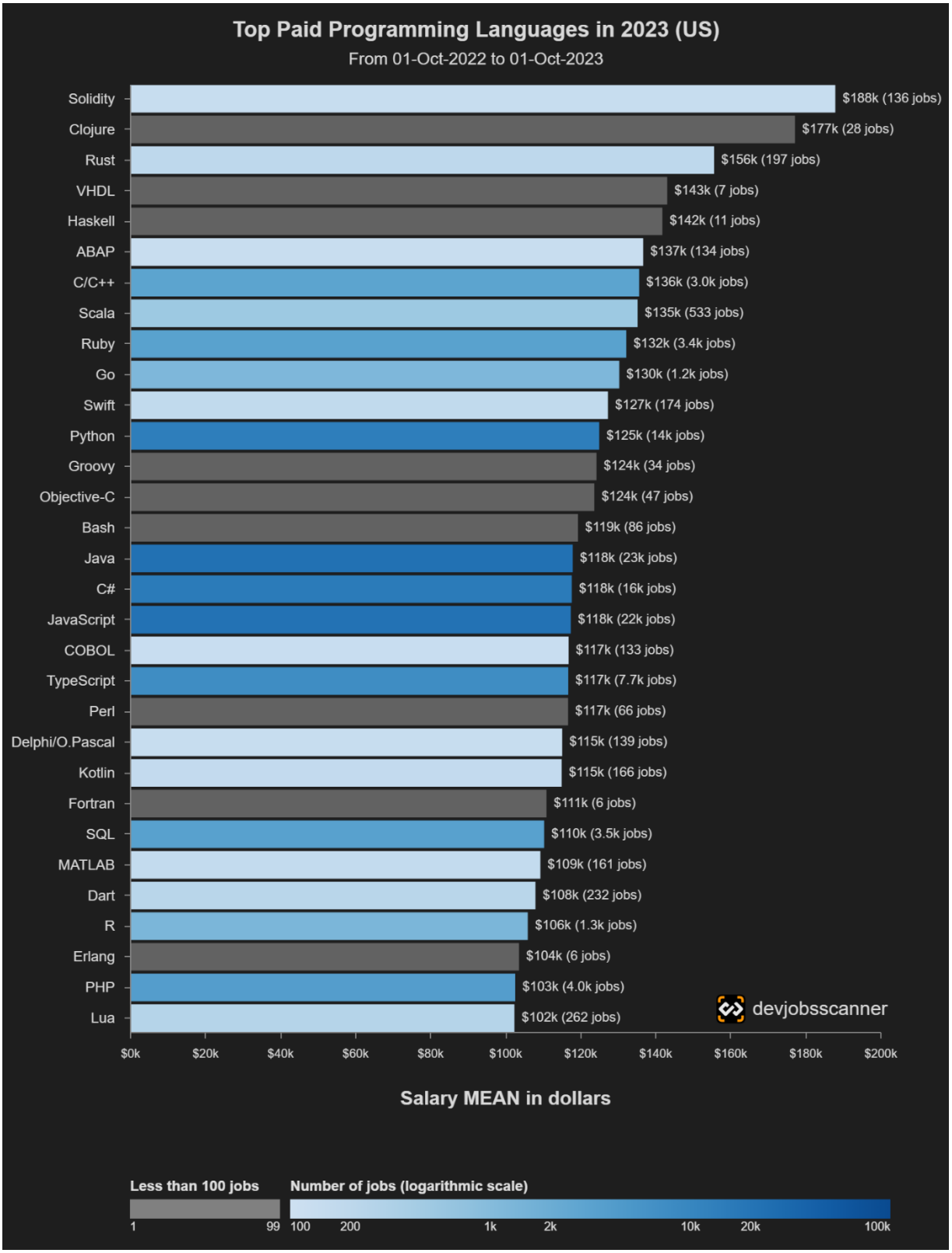
The main project requirements involve selecting a programming language that the developer finds interesting but has limited prior experience with. In the table provided below, different languages meeting these criteria are assessed based on a set of predefined criteria. This evaluation serves as the foundation for choosing the appropriate programming language for the project.

Programming Languages Evaluation

| **Criteria** | **Python** | **Ruby** | **Swift** | **C#** |
|---|---|---|---|---|
| Programming type | General-purpose | Web | Mobile | General-purpose |
| Job Postings (Jan 2022- May 2023) | 604,000 | 135,000 | 5,000 | 375,000 |
| Potential Salary (US) Oct 2022 – Oct 2023 | $125,000 | $132,000 | $127,000 | $118,000 |
| Main Advantage | Writing / Readability | Programmer satisfaction | Readability | Large-scale applications |
| Main Disadvantage | Interpreted (slow execution) | Complex syntax | iOS only applications – no interoperability | Windows-based only – no interoperability |
| Open Source? | Yes | Yes | Yes | Yes |
| Paradigm | Multi-paradigm | multi-paradigm | Multi-paradigm | Multi-paradigm |
| Community | Large, continuously growing | Strong, continuously growing | Small | Small outside of Microsoft community |
| # of Libraries (2019) | 180,000 | 150,000 | Inconsistent information available | 160,000 |




(*Top 8 most demanded programming languages in 2023*)




(*Top 10 highest paid programming languages in 2023*)

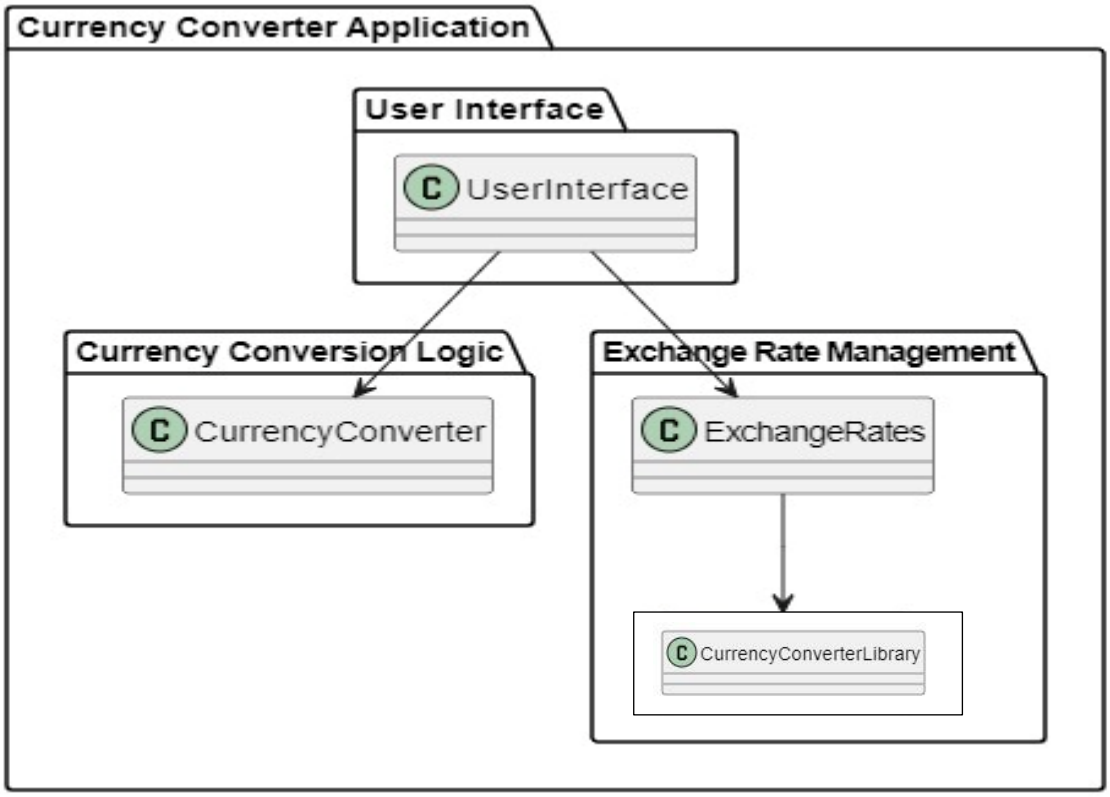
## Selection

After careful consideration, Python emerges as the preferred programming language for this project. Its ease of learning, versatility, and abundant job opportunities make it a compelling choice. Python boasts a vast and continuously expanding community, offering extensive support and resources for developers. With its extensive library ecosystem, Python stands out as a flexible tool capable of addressing diverse application development needs. As a general-purpose language, Python offers the flexibility to tackle various challenges across different domains and industries, making it an ideal fit for this project.

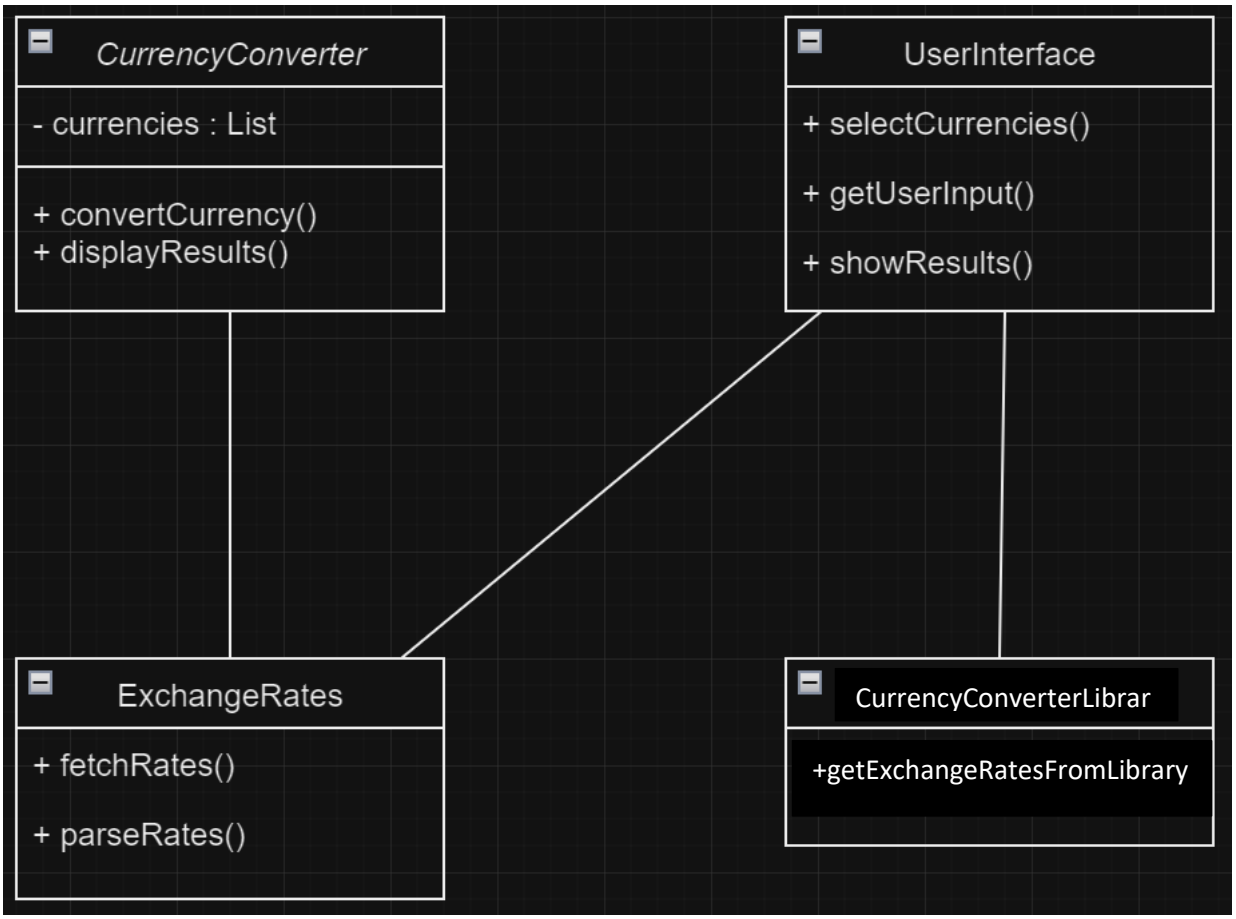
## Conceptual Design

In the conceptual design phase, the architecture and functionality of the Currency Converter Application were outlined. The system is designed to facilitate seamless communication between the user interface, application logic, and external data sources. The core functionalities include currency selection, exchange rate retrieval, conversion calculations, and display of conversion results. The user interface is designed to be intuitive and user-friendly, allowing users to select currencies easily and view conversion results at a glance. The application will fetch real-time exchange rates from reliable online sources to ensure accurate conversions. The entire application will run as a desktop application, providing users with accessibility and offline functionality without the need for internet connectivity.

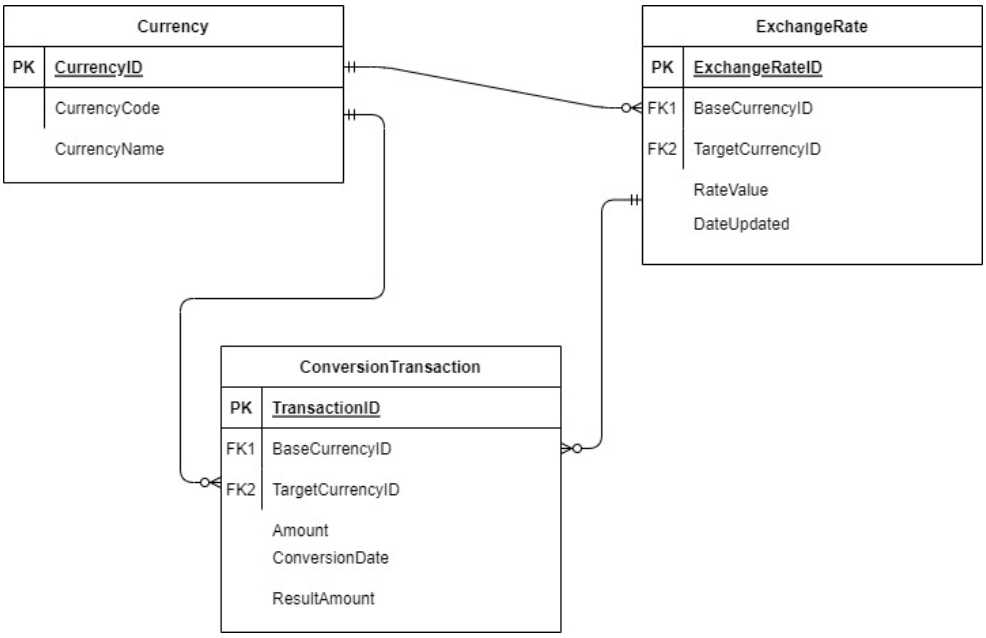
## Package Diagram



## Class Diagram



## Entity-Relationship Diagram




## UI Prototype


Currency Converter
Currency Converter
Enter amount here:
100
From Currency :
CAD
To Currency :
EUR
Convert
100 CAD is 67.88 EUR


Currency Converter
Currency Converter
Enter amount here:
200
From Currency :
usd
To Currency :
cad
Convert
200 USD is 270.49 CAD

## References

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