**Project Design Group 1**

**Currency Conversion Application**

**UMGC CMSC 495 Section 6380**

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**Functionality and Scope**

Group one has built an intuitive and secure UI for the currency conversion application, It allows users to get a near real time conversion between more than a hundred currencies as well as some popular precious metals and cryptocurrencies. The user interface is web based and can be accessed from any browser on a computer or mobile device. Features include:

* Drop down menu for target currency
* Drop down menu for source currency
* Convert button
* Conversion output text box
* History button, that will display the last ten conversions a user has run
* Flag display for both target and source country currency selections

**Application Structure**

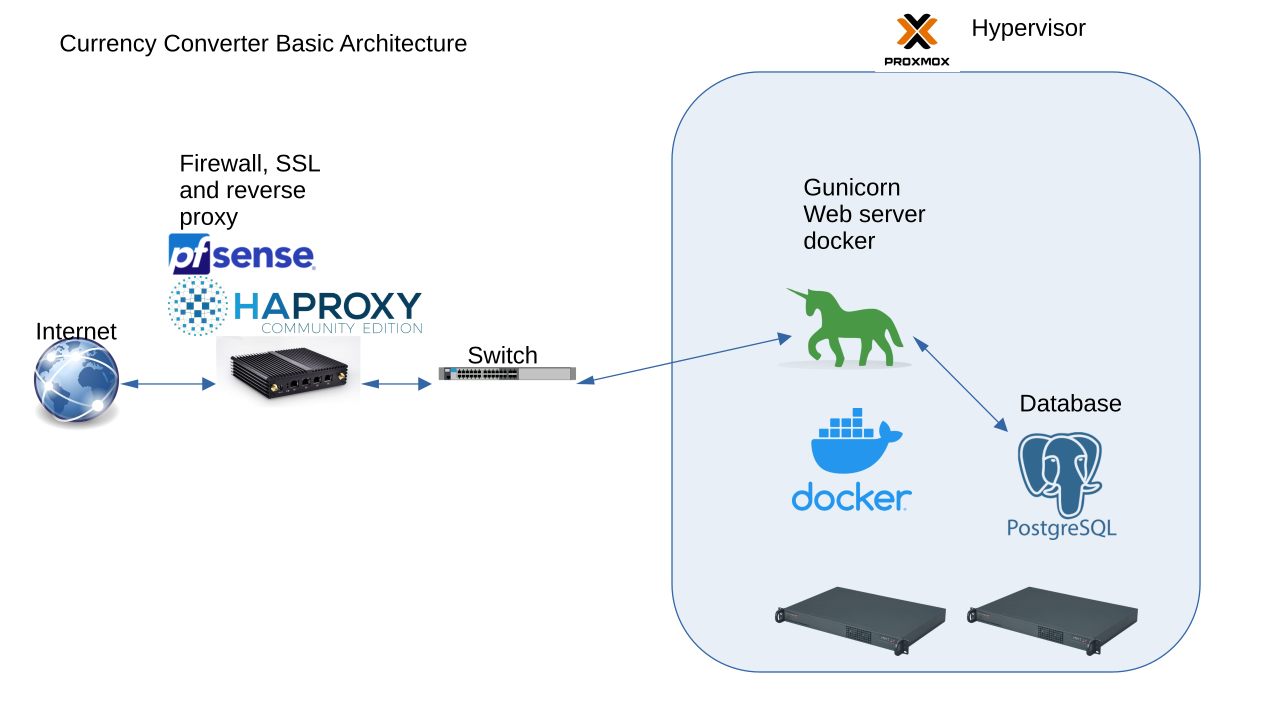
The application itself will consist of the main components, a web interface to allow the user to interact with the application, this will be formatted in HTML with CSS, tailwinds, and HTMX the next piece is the backend that will make calls to a conversion API to get current rates in USD and make conversions. The backend will be written in python with flask. The third piece will be a Postgres database to capture user interactions and cache data. The database will be queried using SQL.

**Production Environment**

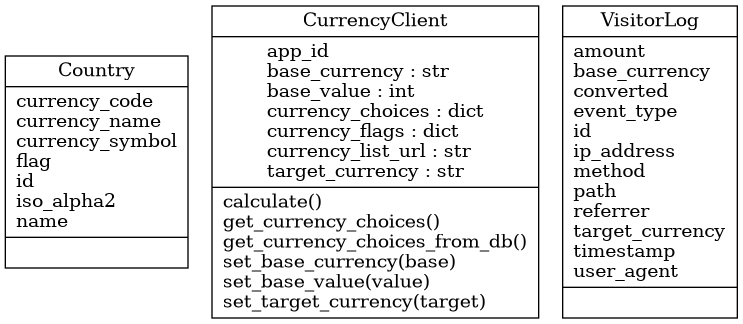
The application needs a reliable and secure deployment environment to ensure reliable and safe operation. The target will require the following features:

* Firewall with SSL certificates Pfsense running on FreeBSD on a dedicated hardware
* Reverse Proxy with SSL offloading, HA Proxy
* Virtualization/hypervisor, Proxmox cluster
* Docker host, Debian Virtual machine.
* Webserver, gunicorn
* Postrges Database, Debian Virtual Machine or LXC container

**Architecture Diagram**



**UML Classes**



**Packages relationships**



**Schedule**

A schedule with a schedule

AI-generated content may be incorrect.

A list of tasks with text

AI-generated content may be incorrect.

**Personnel Resources**

Project Manager

This person is responsible for managing the team and organizing meetings. They are responsible for contacting the client about any updates or issues that occur throughout the project. They ensure that all deadlines are met, and requirements are completed. The project manager for group one is Jackson Perry.

Programmer

All team members can work together to ensure the function and logic of the tools algorithms as well as ensuring performance and safety of the application. This is to ensure that integration testing is performed as development happens and acceptance testing is thoroughly completed prior to delivery with a focus on security and accuracy.

User Interface Designer

These individuals are responsible for designing and layout of the graphical user interface for the project. The front end of the program will be developed with HTML/CSS/tailwinds The team as a group will manage this portion of the project.

Tester

All team members will serve as testers and complete a rigorous test plan as outlines by the Project manager. Sufficient assertion within the codebase is also desired. We will test for functionality and correctness but also for appropriate error handling and graceful failure .

**Methodology**

An agile approach will be employed as it benefits the dynamic and fast-paced development environment. Incremental releases of the application will ensure that features are added in smaller, usable chunks and can be tested more efficiently to minimize risks. Agile allows for more flexibility in a collaborative setting and will be aided using GitHub for version control and clear communication of a cross-functional team.

**Risk Management**

There can be several risk factors that may result in project delays or that could affect the overall efficiency of the program. Some of the risks that can be anticipated are:

* Team Availability
  + We may fall behind due to scheduling conflicts if we are unable to consistently meet and discuss the development of the project
  + To resolve this issue, we will predetermine a set time for weekly communication where we will discuss what we have accomplished and what needs to be done. There will also be an ongoing chat forum via Discord
* Teamwork
  + Team collaboration in computer science is a new territory for some in the group. Members will learn to work together in a virtually remote setting and use version control software (GitHub) to submit a cohesive program.
* Unfamiliarity with specific programming languages
  + There are some members that may be more familiar with the languages chosen to create the program. Each of us is expected to familiarize ourselves with the languages that we will be using so that we are better prepared to contribute to the group. Open and respectful communication among members will enable us all to grow as programmers.

**Evaluation Plan**

The team will be testing the application with Pytest to formally unit test each of the core functions. Unit testing will be done regularly throughout development with a series of asserts designed by all members of the team.

Progress will be evaluated each Monday evening at 8pm during our scheduled development reviews by comparing all deliverables to the project milestones outlined in the schedule above. Peer reviews midway through development will also benefit the team. If we asses that milestones are not reachable in the time available for the class we will have to re-scope as a group.