Lab 1

Rewards Maximizer

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1 Introduction

These days consumers can potentially have several credit cards that can originate from many different banks or rewards cards from various businesses. Each card can have different reward programs or discounts based on who it is issued by or who the issuer is affiliated with. Since each credit card rewards program is different, it can be difficult to keep track of which card is best suited to a particular purchase.

In the current process flow, those attempting to make a purchase must first identify their purchase, inventory their credit card, and for each card, they must search for card rewards. They repeat this process for each card and at the end must compare the rewards to identify the best card, then, if the store has a rewards program, they must remember to present their rewards card and then present the best credit card for this purchase. For the current process, this frustration loop in blue is lengthy and tedious to perform manually. This makes it not worth the effort for smaller purchases, and the process only ends up being used for larger purchases.

Rewards Maximizer is a software in the form of a web application that will allow you to maximize your credit card rewards in conjunction with vendor specific reward systems by providing you with a comparison from the credit cards that you may add and remove from your wallet.

2 Product Description

As an answer to the question of which credit or rewards card to use, Rewards Maximizer will be a website application that will help to optimize rewards. This software will allow the user to enter all credit and rewards cards in the user's possession into a wallet inside the program. For each use case, the customer will enter their purchase. Rewards Maximizer will then search for potential purchases from different businesses and return the credit and rewards cards that will award the most points or discounts pertaining to the searched item.

2.1 Key Product Features and Capabilities

Rewards Maximizer will provide a simple, clean user interface. It will give the user a digital wallet to store credit cards and rewards as well as allow the user to search for cards not in their wallet.

During its regular use case, it will provide optimized card and rewards program recommendations. These recommendations will be improved by utilizing crowdsourcing by allowing users to share information about cards/rewards as well as enabling user feedback and allowing integration of vendor-specific deals and reward systems. It will allow companies to post updated information on their cards and rewards programs.

Features	Rewards Maximizer	PayPal Honey	Rakuten	NerdWallet	Rocket Money
Crowdsourcing	✓				
Search and compare credit cards	✓			✓	
Wallet functionality	✓			✓	✓
Gives cash back on purchases		✓	✓		
Search web and applies coupons		✓			
Exclusive use of anonymous data for analysis	✓				
Integration of vendor-specific deals and reward systems	✓	Partial	Partial		
Company Updates	✓	Partial	Partial		
Search company rewards and loyalty programs	✓			Partial	
Notifications and Alerts	✓	✓	✓	✓	✓

Figure 1: Competition Matrix

2.2 Major Components

The Web application front end will be built with HTML, CSS, and JavaScript, as well as Bootstrap and Ember.js. The back end will be built with Rust, Rocket, Diesel, Python, Beautiful Soup and SQLite.

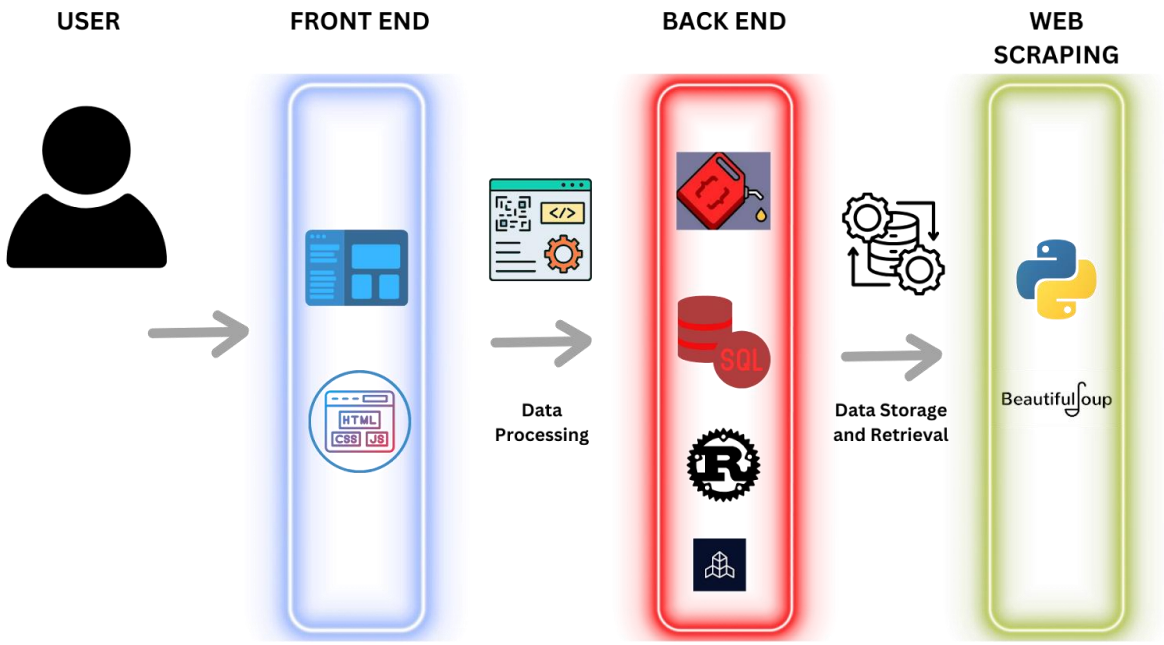

Figure 2: Major Functional Components Diagram

3 Identification of Case Study

While the application is relevant to all consumers, it would most likely be used by money conscious consumers. It is possible the application may be used in the future by larger scale companies needing to buy products in bulk.

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4 Product Prototype Description

The prototype will implement account management, login authentication, and the search system. The web crawler may have reduced functionality leading to an incomplete dataset, this leads to the card optimization algorithm being simulated rather than fully implemented.

Features	**Real World Product**	**Prototype**
User Account Setup	Fully Implemented	Not Implemented
Login Authentication	Fully Implemented	Not Implemented
Wallet Functionality	Fully Implemented	Not Implemented
Current Purchase Search	Fully Implemented	Not Implemented
Card Optimization Algorithm	Fully Implemented	Not Implemented
WebCrawler	Fully Implemented	Not Implemented
Feedback System	Fully Implemented	Not Implemented

Figure 3: RWP Prototype Comparison

4.1 Prototype Architecture (Hardware/Software)

The Prototype will require a basic server as a host. In the Presentation layer, the user will access Rewards Maximizer through a web application. In the Application Layer, the GUI will allow the user to access their digital wallet, select a product they wish to search, or give feedback. Each of these components interact with the Data Layer which stores information and interacts with the web crawler and card optimization algorithm.

4.2 Prototype Features and Capabilities

The prototype will demonstrate the capability for users to create their account and set up their cards. The WebCrawler algorithm will demonstrate the ability to read data from a dummy site as well as normalize and store it in the database. The card optimization algorithm should demonstrate the ability to select the correct card given the data collected.

4.3 Prototype Development Challenges

Some challenges that may be encountered are domain knowledge gaps. The intricacies of credit card and vendor rewards will require additional research. Additionally, there may be a knowledge gap in technical expertise.

5 Glossary

Term	Definition
Application Programming Interface (API)	A software intermediary that allows two applications to talk to each other. APIs are an accessible way to extract and share data within and across organizations.
CSS (Cascading Style Sheets)	A stylesheet language used to create web pages. It describes how HTML elements are to be displayed on screen, paper, or in other media.
Graphical User Interface (GUI)	A form of user interface that allows users to interact with electronic devices through graphical icons and audio indicators instead of text-based interfaces, typed command labels, or text navigation.
Git	A version control system that tracks changes in a set of source files. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files.
GitHub	A platform for software development and version control using Git. It provides tools for collaboration, code review, and project management.
HTML (Hypertext Markup Language)	The standard markup language used to create web pages. It describes the structure of a web page and is used to embed text, images, videos, and other media.
JavaScript	A programming language used to create dynamic content on web pages. It allows for the implementation of complex features such as interactive forms, animations, and other elements that enhance user experience.
Rewards/Loyalty Program	A program offered by one vendor to entice customers to return, usually offering discounts or free products as incentives.
Rewards Credit Card	Credit cards that offer you some type of reward, typically cash back, points, or travel miles, for every dollar a customer spends. These rewards can be redeemed for various benefits.
WebCrawler	A program that systematically searches web pages for specific information. It is often used by search engines to index content from across the internet.

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