Group Project Proposal - Simple Wealth
CSCI 4610U/ SOFE 3720U Artificial Intelligence
University of Ontario Institute of Technology

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Problem Statement

Investing and other wealth building methods are not fully being utilized by a large percentage of the general population. Current barriers to entry have been a steep initial learning curve, high commission fees from financial advisors and the false assumption that one must start with a large sum.

We aim to tackle the issue of a steep learning curve by providing a platform where users are given personalized recommendations based on user goals and changes in the market.

Motivation

In recent times, apps such as Wealthsimple have been introduced in the market to make investing easy by doing everything for the user. However, this does not teach or guide the person how to learn and become better themselves. As more automated investing platforms become available, the effectiveness will decrease due to everyone using the same algorithms.

Knowing that heavy human involvement is still the best way to capture respectable returns, our recommendation system provides recommendations based specifically on the user and will make the transition from a beginner to an experienced investor easier.

I/O Specification

The system will take in user preferences, portfolio history, stock prices and trends. The system will output recommended stocks to buy, sell or hold.

Background Reading

Stanford Recommender Systems Course
https://www.youtube.com/watch?v=1JRrCEgiyHM

"Alpha Vantage API Documentation." *www.alphavantage.co*,
www.alphavantage.co/documentation.

Poole, David L., and Alan K. Mackworth. *Artificial Intelligence: Foundations of Computational Agents*. ISBN-10:0521519004

General Approach

Simple wealth will implement an adaptive set of rules based on user inputted parameters and activity. While in the stock trading page, the system records the frequency, risk and amount of stocks bought and sold. In real time, it refines the investment suggestions as the user continues to make choices. For example, if one often invests larger sums of money into riskier stocks, Simple Wealth will log these preferences and recommend riskier stocks.

Where's the AI?

Initially, the rules will be established by the individual's profile. The artificially intelligent component is the "learning" functionality that suggests specific stocks relevant to the user's previous actions. A recommender system will rank and collate a list of selected options from a historical stock database.

Data Sources

Stock data will need to be collected through the use of one of the following APIs:
- IEX Trading API
- Alpha Vantage API

System Architecture
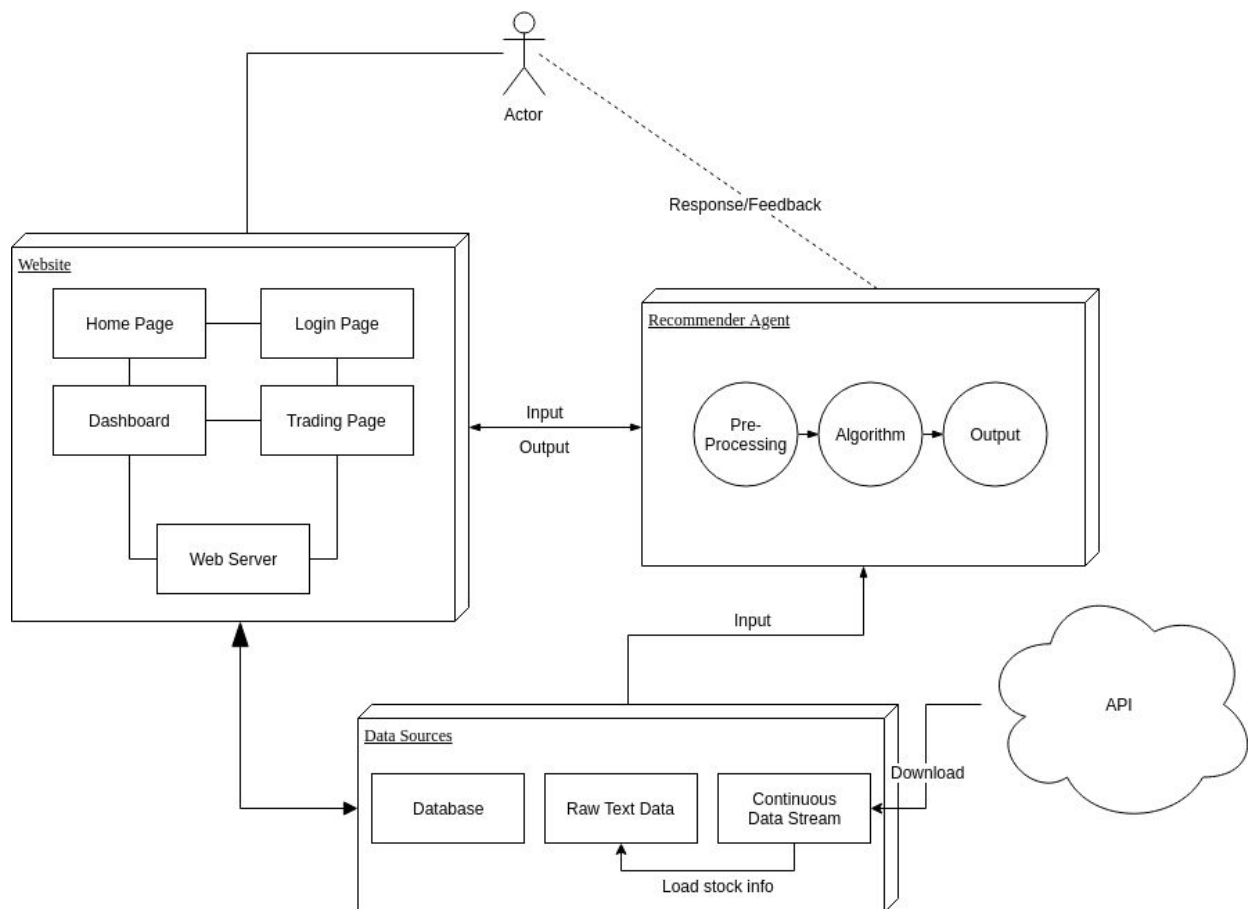
Website
- The interface used by the user to buy and sell stocks
- Members: Shayne, Matt

Recommender Agent
- Provide a list of recommendations based on user profile and stock market data

- Members: Jude, Matt

Data Sources
- Store user, stock info and processed data
- Members: Mitchell, Matt

Testing
- The Front End will be tested using black box methods
  - Valid and invalid logins as well as null sessions and sql injections will be tested
  - Sql / javascript injections will be tested
  - Verify the correct data is loaded on the dashboard, and test any text boxes for code injections
  - Test the trading page to ensure:
    - You can only buy stocks that are available
    - You can only sell the stocks you have (in the correct amounts too)
    - You cannot buy stocks with money that is not available
    - You cannot modify stock prices
- The Back End will be focused on making sure the database is functioning properly
  - This will be done by manual inspection of the code to ensure that the tables are setup correctly
  - The API will be tested by comparing the information provided by the API's to the live data on Google Finance.

Schedule
The group plans to meet on Thursdays at 11:30 am on a weekly basis at the university.

Date	Milestones
Jan 20, 2019	Project proposal due date
Feb 18, 2019 (Reading Week)	Framework for website established, User database created
Feb 26, 2019 (Midterm)	Website UI designed, Stock API implemented, AI algorithm built
Apr 1, 2019 (Final week)	Presentation complete