Financial Prediction Application

Christopher Ochs
Matthew Krauskopf
Philip Tallo
Kyle O'connor

Advisor: Professor Yizong Cheng

Agenda

- Project Description
- Project Progress
- Timeline and Division of Work

Project Description

Abstract

To allow users to have better control over their finances, we will provide a web-based multifaceted application. The application will allow for end users to examine specific publicly traded stocks and get a prediction, with a specific degree of certainty, on whether to buy or sell a particular stock. This functionality will allow for users to manage their finances comfortably.

User Stories

As a **professional stock broker**, I want to **be able to predict stock trends before they happen**, so that **I can provide the best investment advice to my clients**.

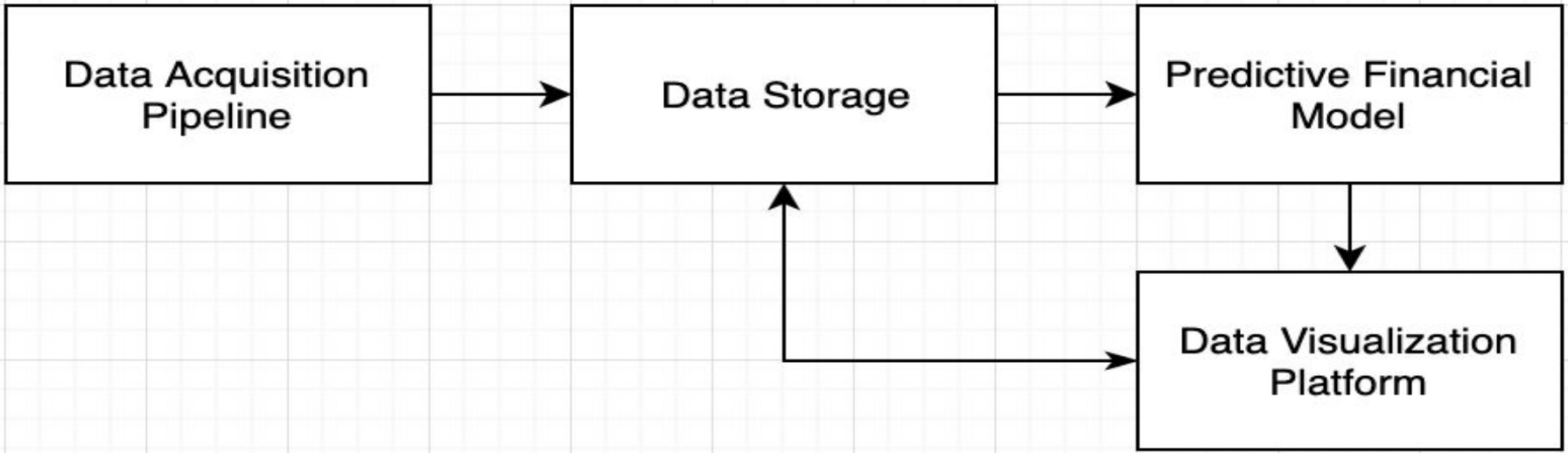
As an **individual investor**, I want to **better understand the stock market fluctuations**, so that **I can make safer investments**.

As a **brokerage firm**, We want to **modify the prediction model with attention to specific variables**, so that **we can focus on specific trends we are informed on**.

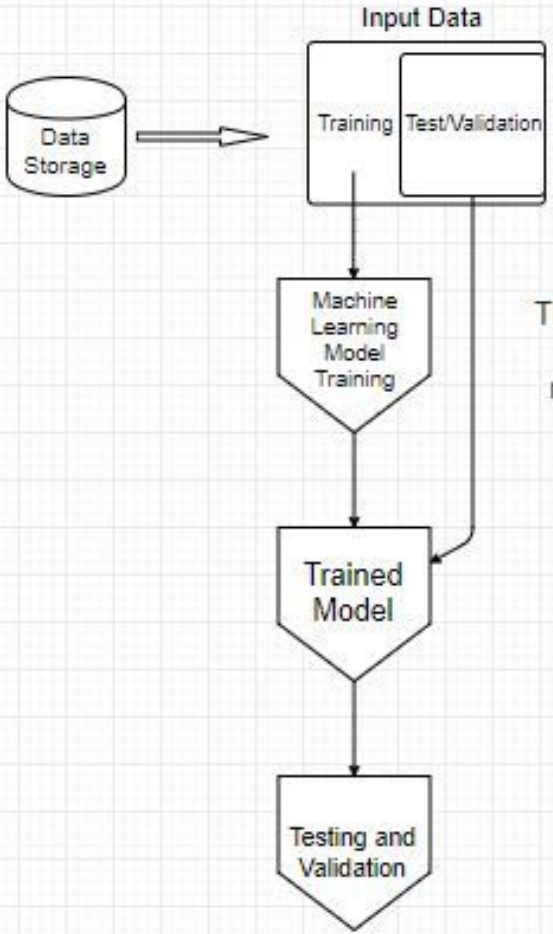
Financial Predictive Modeling

The goal of this project is to build a machine learning model to predict trends in the stock market.

Design Level 0 : High Level Overview, arrows in this diagram represent the way data flows through our system



Machine Learning Model



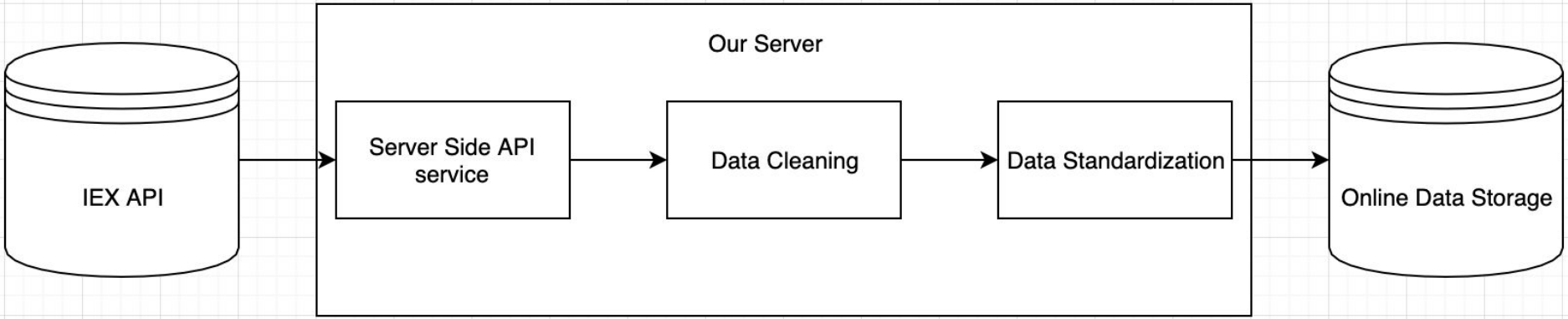
Project Description:
The goal of this project is to build a machine learning model to predict trends in the stock market.

Data Acquisition Pipeline

The goal of this project is to build a machine learning model to predict trends in the stock market.

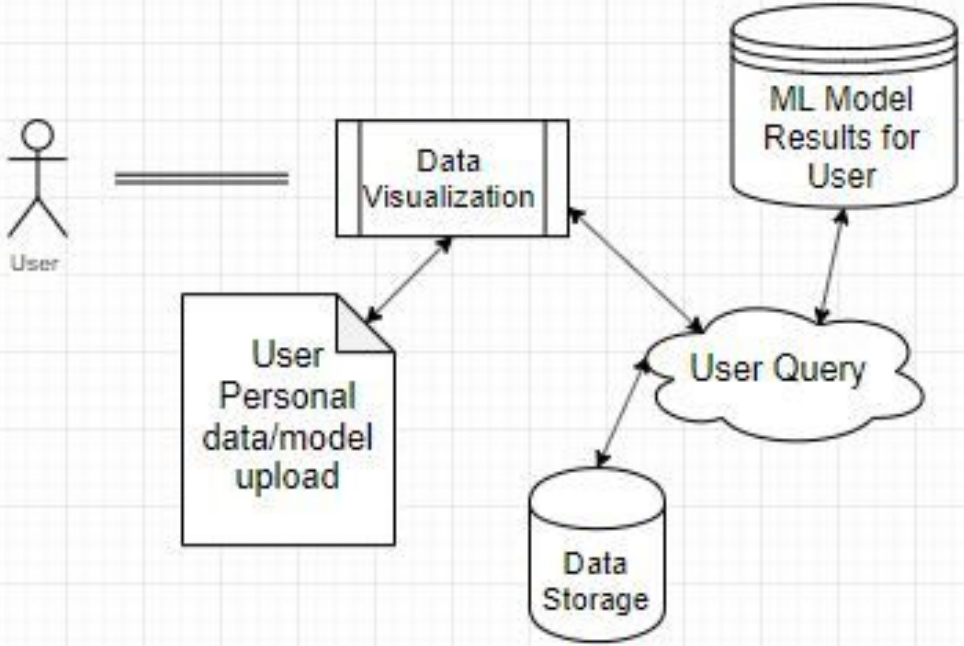
Design Level 1 : High Level Overview, arrows in this diagram represent the way data flows through our system

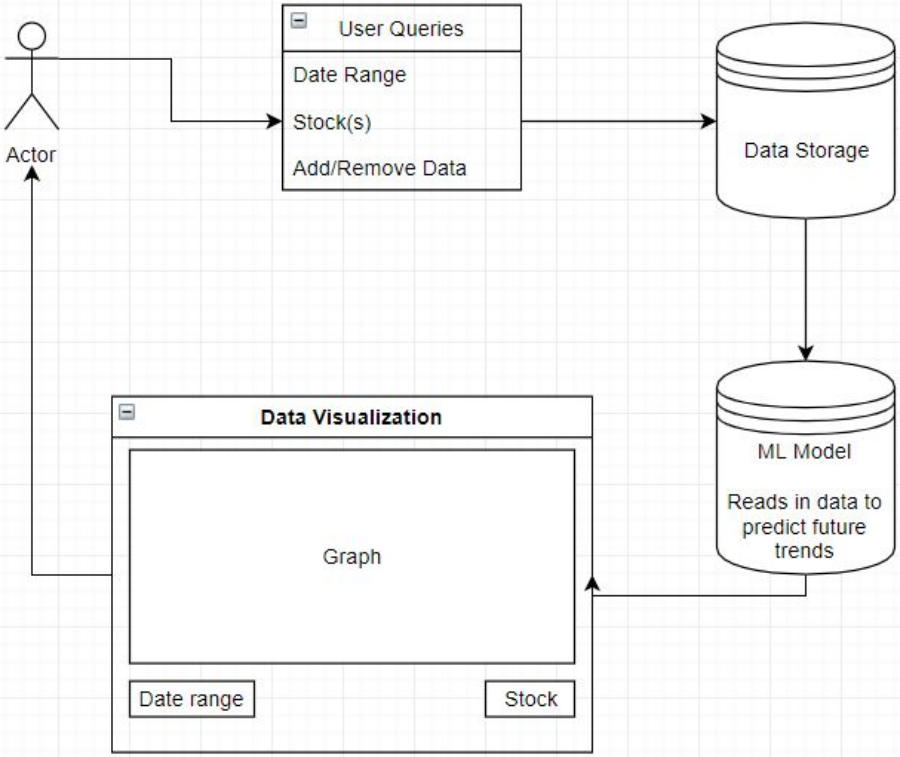
Note: This data acquisition pipeline will be running continuously for two purposes. To train our model to be more accurate, as well as to supply our data visualization platform with all the data it needs.



Data Visualization

Project Description:
The goal of this project is to build a machine learning model to predict trends in the stock market.





User Queries: User will be able to query for certain stocks (including general DOW), what date range they want, and be able to exclude date ranges from model consideration.

Data Visualization: Display graphs with respective dates/value, and show where stock is expected to trend as predicted by our model.

Constraints

Financial

- Cannot afford high-power computing to rigorously train a data model.
- API's available for public use limit how many calls can be made for free.

Professional

- A successful model could impact people's day-to-day lives for those invested deeply in the stock market as well as the companies themselves.

Legal

- Success could lead to legal repercussions with SEC, FIRNA, FTC.

Project Progress

Current State

- Explicitly defined parameters
- Clearly outlined deadlines
- Methodology for collecting data
- Methodology for storing/streaming

Expected Progress

- Obtained collection of past stock market data.
- Automated the future collection of market data.
- Implemented proper data sanitization.
- Design and creation of machine learning model
- Create structured webapp for end-users

Timeline and Division of Work

Project Timeline (1)

- (12/14 - Kyle) Setup data storage in the Cloud
- (12/14 - Phil) Develop the Server Side API Service
- (1/13 - Chris) Develop the data cleaning and standardization methods
- (1/21 - Matt) Acquire the data to train the model
- (1/21 - Matt) Set up a continuous flow of data into the model
- (2/21 - Kyle & Phil) Refine ANN architecture
- (2/21 - Kyle) Train the model
- (2/28 - Kyle) Refine the hyper parameters of the model
- (3/21 - Chris) Develop a continuous integration pipeline for deployment

Project Timeline (2)

- (3/21 - Phil) Design the UI for the website
- (3/21 - Phil) Develop the web app
- (3/28 - Chris) Integrate the model into the web app
- (3/28 - Chris) Develop a query system for the User

From 3/28 -> 4/14, refine everything we have.

Expected Demo

Our Demo should contain the following

- A fully functioning web-application with data visualization of data trends.
- A model which predicts the price of a stock.
- Documentation of our software.

Thank You

Christopher Ochs - ochscs@mail.uc.edu

Matthew Krauskopf - krauskmr@mail.uc.edu

Philip Tallo - tallopt@mail.uc.edu

Kyle O'Connor - oconnokb@mail.uc.edu