Stock Price Data Processing & Prediction System

Team #1

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Contribution breakdown

Yuhang Zhou	Machine learning model development for trend searching
Jiachen Ding	Web front-end development and model tuning
Lichuan Ren	Data processing and web front-end development
Haofan Zhang	Machine learning model development for price prediction

Background

Existing stock price systems show price trend lines

RNN has been implemented into stock price prediction and decision making
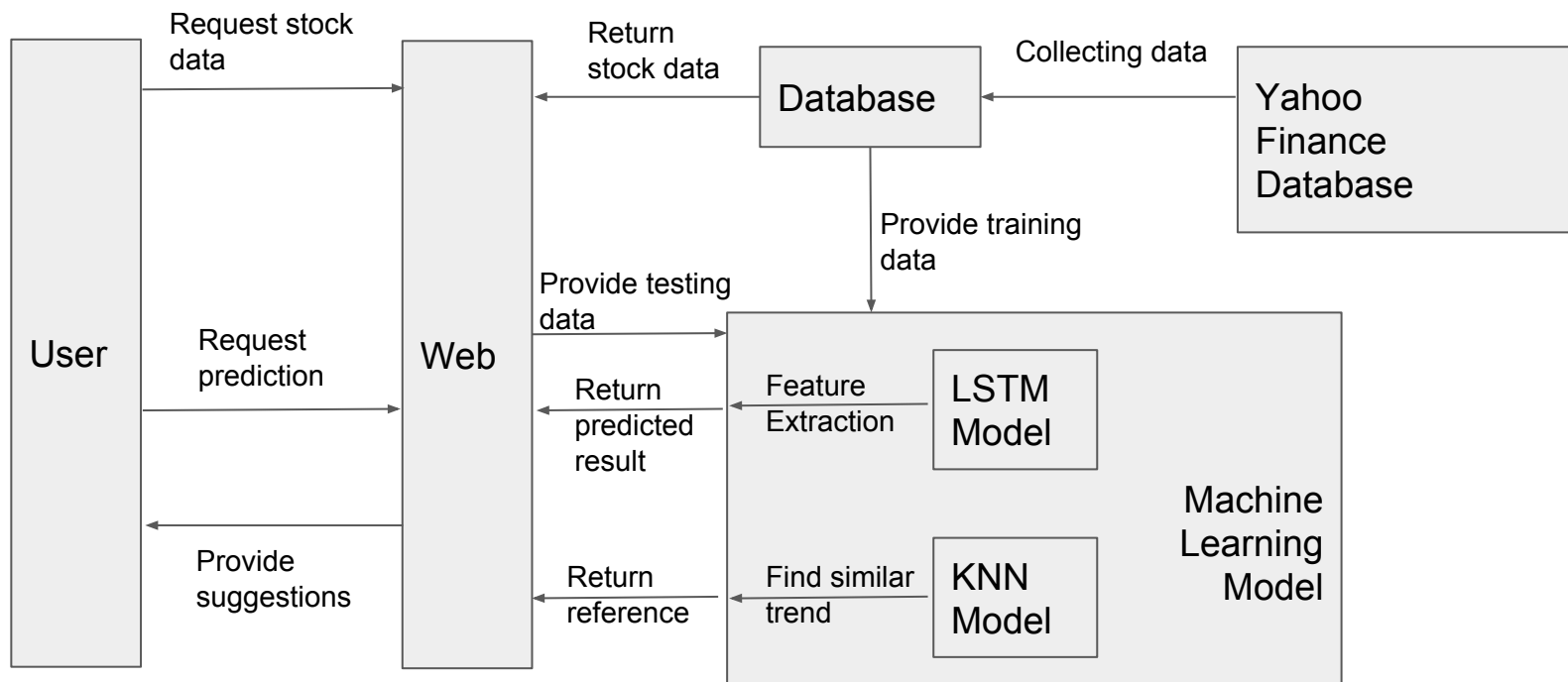
What we do?

Implement LSTM to make stock price prediction and trading suggestion

Future trend lines figuration

Search for the similar trend from the history data and provide reference

Architecture

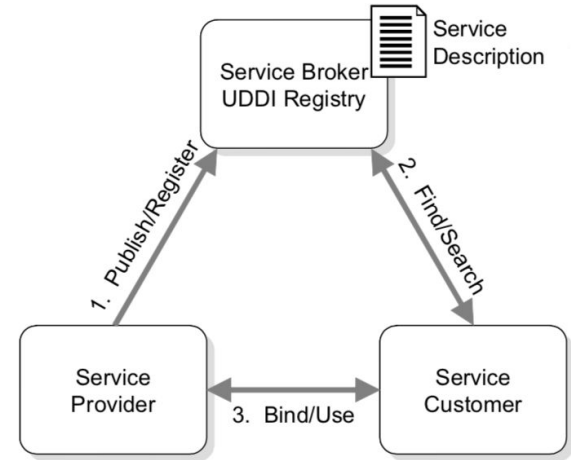# Web Service Interface

SOAP Communication Protocol

Medium: HTTP (POST)

Format: XML (SOAP Message Structure)

Using WSDL to Generate SOAP Binding

Using UDDI for Service Discovery and Integration

Implementation: Apache Axis Web services engine

Use Cases

1. Access and look up the history stock price by the symbol and time range

2. Predict the stock price

3. Provide suggestion to user to decide whether to buy, sell or hold

4. Find the similar trend in the history and provide reference

Prediction Strategy

1.Using history data to train LSTM model to predict future price and give trading strategies (i.e. "buy", "sell" or "hold")

2.Using KNN model to find similar trend and give traders reference for future stock movements

LSTM Model
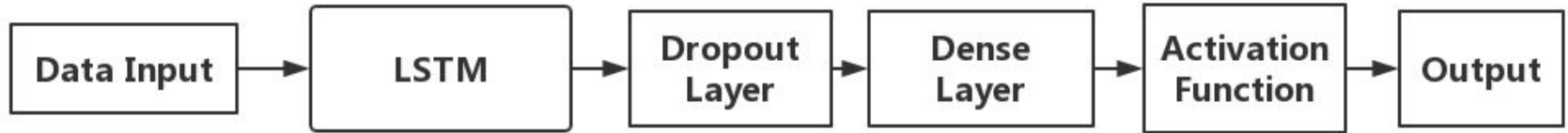
Loss = –100. * mean(P * (R – c))

P: Output of the model

R: Change rate of price on the next day

c: Budget like interest of saving account

LSTM

1.Use the stock price and volume of the previous 1000 trading days as input and output are predicted price & volume

2.Using 3000 stocks as training data and finally training a model with high accuracy as a stock price/volume forecasting and trading suggesting model.

KNN

- KNN: Take **majority vote** from *K* closest points
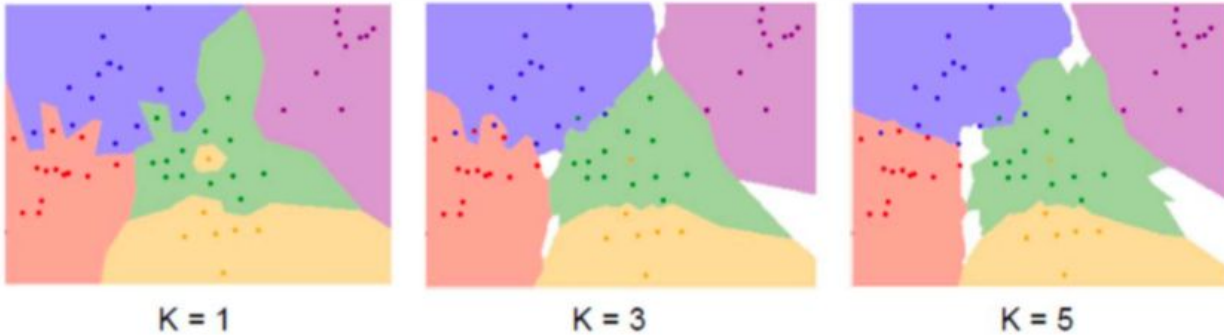
1. Using KNN to find the price trend in the history data which are similar with recent trend

2. The price change after this trend is also provided for user as reference

Web sources

Stock price data source from Yahoo Finance

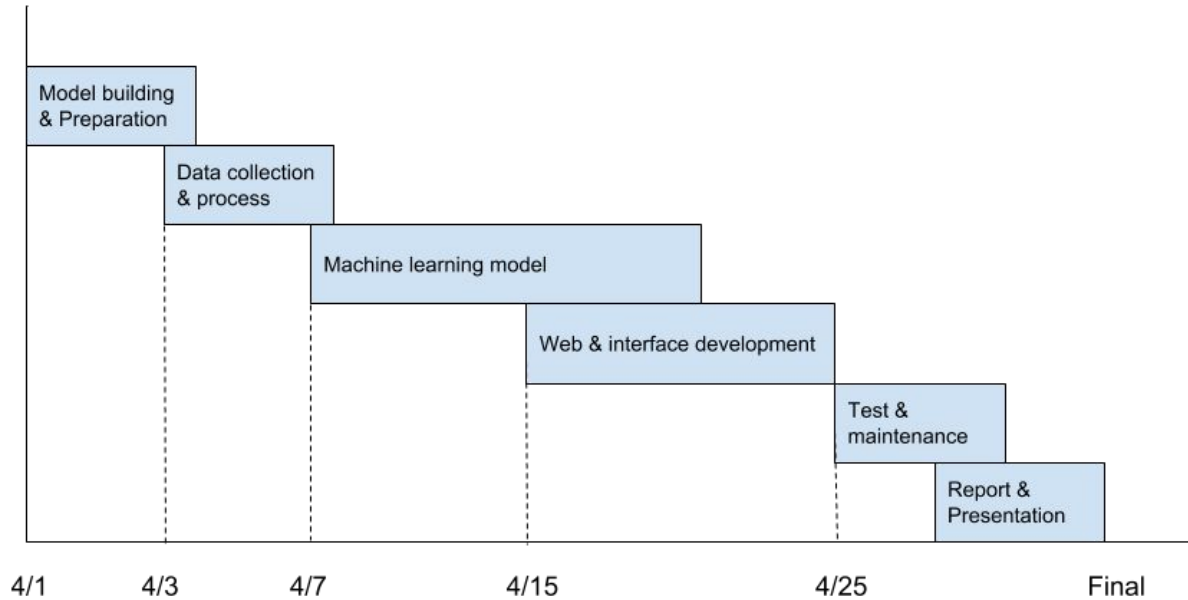Investment suggestions summarized from finance articles

Achieved Tasks

Data collection

Simple neural network implementation

Prediction model hypothesis

Timeline

Technologies

Language: Python, html, xml

Database: MySQL

Datatype: Numpy, Pandas,Tensor

Machine learning frame: Pytorch

Data source: Yahoo Finance

Thanks!