Stock Analysis Tool

SOFE3700 Final Project

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Link to site

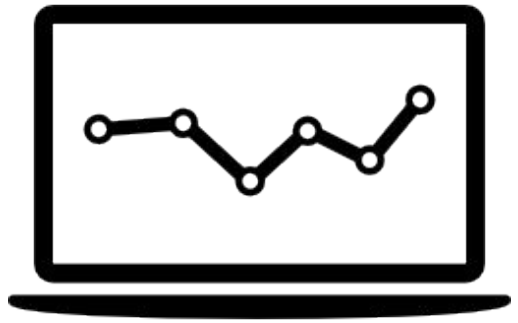
https://msbbgymzbb.localtunnel.me

Objective

- On demand stock data
- Analysis tools and visualization
- Be up to date
- Easy to setup and use

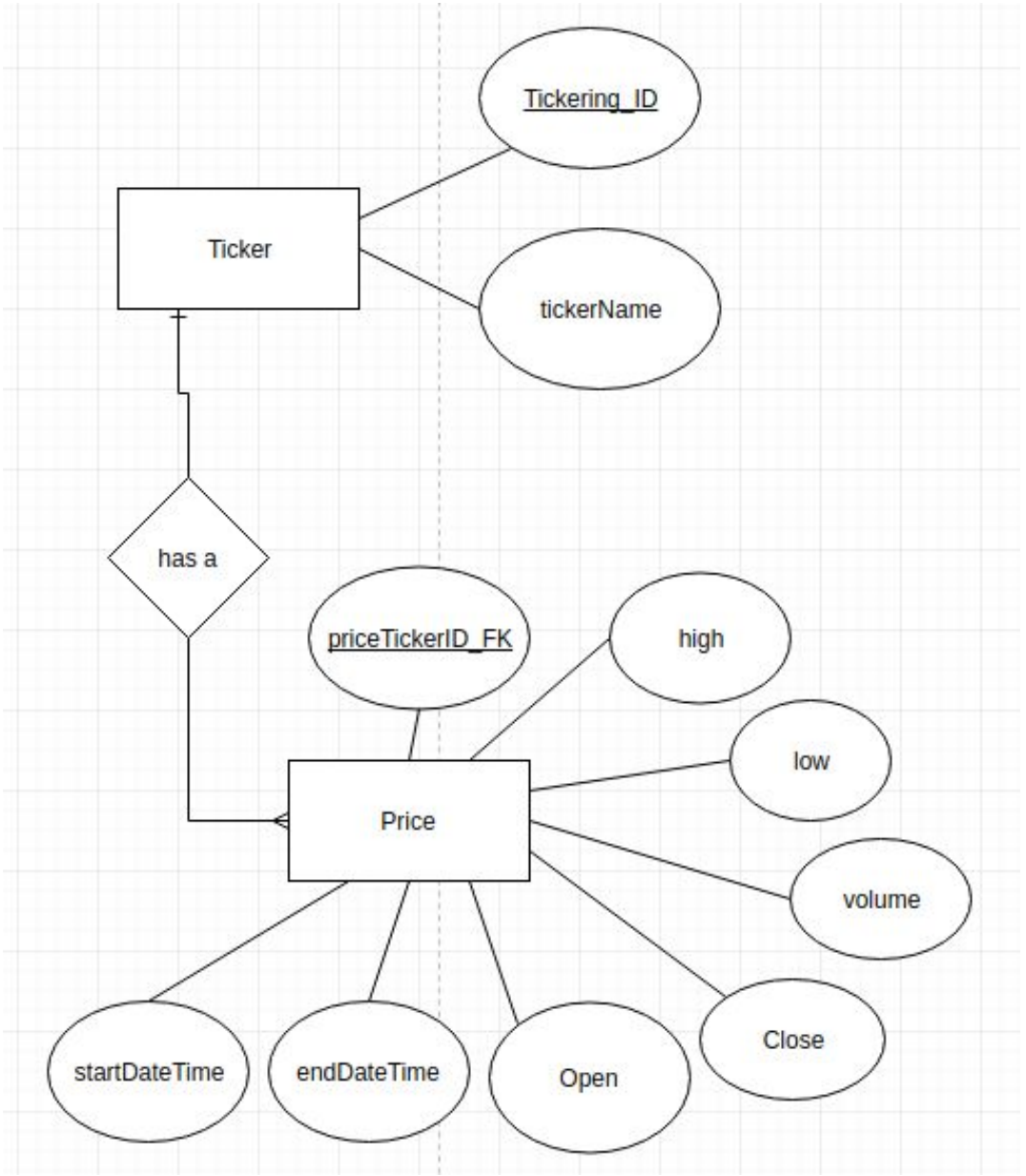
Overview

- Tool for analyzing financial data
- Contains data on various companies over the past 10 years
- Over 20,000 rows of financial data
- Contains visualization tools as well as raw data
- Can manipulate and save visualizations



ER Diagram

- Only requires two tables
- Other values can be derived



Database

- SQLite serverless database
- Lightweight and portable
- Load data initially from external API (Quandl)
- Historical data for 13 stocks (GOOGL, AAPL, MSFT, etc…)

Ticker Table

- Tickers table contains ‘Tickers’
- Contains associated id
- Contains associated company

	id	name	company
	Filter	Filter	Filter
1	1	GOOGL	Alphabet Inc Class A
2	2	MSFT	Microsoft Corporation
3	3	AAPL	Apple Inc.
4	4	AMZN	Amazon.com, Inc.
5	5	NVDA	NVIDIA Corporation
6	6	TSLA	Tesla Inc
7	7	INTC	Intel Corporation
8	8	IBM	IBM Common Stock
9	9	CSCO	Cisco Systems, Inc.
10	10	AMD	Advanced Micro Devices, Inc.
11	11	ORCL	Oracle Corporation
12	12	QCOM	QUALCOMM, Inc.
13	13	HPQ	Hewlett-Packard Inc.

Price Table

- Contains financial data
- For each ticker, sorted by date
- Contains associated id
- Contains associated company

	price_id	ticker_id	date ▼	open	high	low	close	volume
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	19370	1	2017-11-24	1054.39	1060.07	1051.92	1056.52	825342
2	21370	2	2017-11-24	83.01	83.43	82.78	83.26	7425503
3	23370	3	2017-11-24	175.1	175.5	174.6459	174.97	14026519
4	25370	4	2017-11-24	1160.7	1186.84	1160.7	1186	3526582
5	27370	5	2017-11-24	215.59	217	214.6	216.96	4517982
6	29370	6	2017-11-24	313.79	316.41	311	315.55	3242220
7	31236	7	2017-11-24	44.55	44.775	44.43	44.75	6465615
8	33236	8	2017-11-24	151.95	152.2	151.33	151.84	1193025
9	35236	9	2017-11-24	36.41	36.57	36.32	36.49	6155294
10	37236	10	2017-11-24	11.38	11.42	11.3	11.38	11033178
11	39236	11	2017-11-24	48.88	49.13	48.69	49.01	6008333
12	41236	12	2017-11-24	68.51	69.28	68.45	68.91	9233010
13	43236	13	2017-11-24	21.44	21.52	20.99	21.24	9657949
14	19371	1	2017-11-22	1051.16	1055.43	1047.25	1051.92	721498
15	21371	2	2017-11-22	83.83	83.9	83.04	83.11	20213704
16	23371	3	2017-11-22	173.36	175	173.05	174.96	24997274
17	25371	4	2017-11-22	1141	1160.27	1141	1156.16	3516336
18	27371	5	2017-11-22	217	217	213.61	214.93	8766814
19	29371	6	2017-11-22	316.77	317.42	311.84	312.6	4890091
20	31237	7	2017-11-22	44.94	44.95	44.535	44.65	19191241
21	33237	8	2017-11-22	152	152.39	151.33	151.77	3125416
22	35237	9	2017-11-22	36.7	36.715	36.36	36.45	16650130
23	37237	10	2017-11-22	11.41	11.49	11.3	11.37	23686100
24	39237	11	2017-11-22	48.56	48.83	48.42	48.58	10618868
25	41237	12	2017-11-22	66.37	68.26	66.24	68.13	15165652
26	43237	13	2017-11-22	21	21.53	20.59	21.34	28411338
27	19372	1	2017-11-21	1040.04	1050.39	1039.14	1050.3	1075568
28	21372	2	2017-11-21	82.74	83.84	82.74	83.72	21033981
29	23372	3	2017-11-21	170.78	173.7	170.78	173.14	24875471
30	25372	4	2017-11-21	1132.86	1140	1128.2	1139.49	2449503

Queries

- This query gets 500 rows of relevant data for the GOOGL stock, ordered by their price id

```
select p.date, p.open, p.close, p.high, p.low, p.volume
from Prices as p join Tickers as t on t.id = p.ticker_id
where p.ticker_id = ? order by p.price_id ASC limit 500
```

Queries (cont.)

- This query gets 50 rows with after a 200 row offset of relevant data for the AAPL stock as well as the corresponding row number, ordered by their price_id

```
select (select count(*) from prices as t2 where t2.price_id <= t1.price_id) as row,
date, open, high, low, close, volume from Prices as t1 where ticker_id = ?
order by price_id asc limit 50 offset 200
```

- We used prepared statements to protect against SQL injections

Plotly

- We used the plotly python data visualization framework
- Provides many features for data visualization
  - Zooming and panning
  - Focus on specific date range
  - Show individual data points on hover
  - Show/hide specific datasets
  - Export plot as an image
  - Edit plot data using plotly cloud

Example plots

GOOGL

Quandl API

- Free financial data API
- Used to get data for our database
- Data is up to date
- Does not require a key

```
https://www.quandl.com/api/v3/datasets/WIKI/AAPL.json
```

Our public API

- Queries our database
- All data used on the website is accessible
- Returns data in JSON format for ease of use

- The following API call requests all closes of MSFT stock after November 10, 2015

```
http://localhost:8080/api/MSFT?col=close&date-start=2015-11-10
```

Future

- More indicators
  - RSI
  - SMA
- Live data (<1hr charts)
- Machine Learning
  - Fundamental Analysis
  - Technical Analysis
  - Company/Bank Forecast