

Data Science Independent Project – Watching the Stock Market

Objective

“You are asked by a company to help them make more informed decisions on investments. To start, you will be watching the stock market, collecting data, and identifying trends!”

Data Collection

I tracked the stock prices of 5 stocks (BAS, SOLB, EVK, XONA, and MMM) at three different times per day (10AM, 12PM, and 16PM) during five days (2023/07/12-14 and 2023/07/17-2023/07/18). The prices were manually inserted into an excel file in which then I imported into DB Browser SQLite using the database I built:

Name	Type	Schema
Tables (1)		
stock	CREATE TABLE "stock"	
id	INT...	"id" INTEGER
name	TEXT	"name" TEXT
sym...	TEXT	"symbol" TEXT
date...	INT...	"datetime" INTEGER
price	REAL	"price" REAL

Disclaimer

I am writing to acknowledge that I do not possess extensive knowledge or professional expertise in the stock market. However, I am utilizing this project as an opportunity to practice and enhance my data analysis skills using SQL. I kindly request your comments or advice to help me improve and grow in this area. I have also utilized https://github.com/bepsidy/stock_watcher/tree/main as reference for this project.

Queries

1. What are the distinct stocks in the table?

```
1. SELECT DISTINCT name AS 'Company name'
2. FROM stock;
```

	Company name
1	BASF SE
2	Solvay SA
3	Evonik Industries AG
4	Exxon Mobil Corp
5	3M Co

2. Query all data for a single stock. Do you notice any overall trends?

```
1. SELECT *
2. FROM stock
3. WHERE symbol = 'SOLB';
```

id	name	symbol	datetime	price
13	Solvay SA	SOLB	2023/07/12 10:00	104.45
14	Solvay SA	SOLB	2023/07/12 12:00	105.05
15	Solvay SA	SOLB	2023/07/12 16:00	105.85
16	Solvay SA	SOLB	2023/07/13 10:00	105.4
17	Solvay SA	SOLB	2023/07/13 12:00	106.2
18	Solvay SA	SOLB	2023/07/13 16:00	106.1
19	Solvay SA	SOLB	2023/07/14 10:00	104.25

20	Solvay SA	SOLB	2023/07/14 12:00	103.95
21	Solvay SA	SOLB	2023/07/14 16:00	103.5
22	Solvay SA	SOLB	2023/07/17 10:00	102.05
23	Solvay SA	SOLB	2023/07/17 12:00	101.45
24	Solvay SA	SOLB	2023/07/17 16:00	101.7
25	Solvay SA	SOLB	2023/07/18 10:00	101.9
26	Solvay SA	SOLB	2023/07/18 16:00	101.7
27	Solvay SA	SOLB	2023/07/18 12:00	101.85

Throughout the five days, the stock price generally decreased. It started at EUR 104.45 in the beginning of 2023/07/12 and ended with EUR 101.85 at the end of 2023/07/17.

3. Which rows have a price above 100? Between 40 to 50, etc?

```
1. SELECT *
2. FROM stock
3. WHERE price > 100;
```

id	name	symbol	datetime	price
13	Solvay SA	SOLB	2023/07/12 10:00	104.45
14	Solvay SA	SOLB	2023/07/12 12:00	105.05
15	Solvay SA	SOLB	2023/07/12 16:00	105.85
16	Solvay SA	SOLB	2023/07/13 10:00	105.4
17	Solvay SA	SOLB	2023/07/13 12:00	106.2
18	Solvay SA	SOLB	2023/07/13 16:00	106.1
19	Solvay SA	SOLB	2023/07/14 10:00	104.25
20	Solvay SA	SOLB	2023/07/14 12:00	103.95
21	Solvay SA	SOLB	2023/07/14 16:00	103.5
22	Solvay SA	SOLB	2023/07/17 10:00	102.05
23	Solvay SA	SOLB	2023/07/17 12:00	101.45
24	Solvay SA	SOLB	2023/07/17 16:00	101.7
25	Solvay SA	SOLB	2023/07/18 10:00	101.9
26	Solvay SA	SOLB	2023/07/18 16:00	101.7
27	Solvay SA	SOLB	2023/07/18 12:00	101.85

Only Solvay SA had stock prices above 100 EUR.

```
1. SELECT *
2. FROM stock
3. WHERE price BETWEEN 40 AND 50;
```

id	name	symbol	datetime	price
----	------	--------	----------	-------

1	BASF SE	BAS	2023/07/12 10:00	46.31
2	BASF SE	BAS	2023/07/12 12:00	46.67
3	BASF SE	BAS	2023/07/12 16:00	47.02
4	BASF SE	BAS	2023/07/13 10:00	46.35
5	BASF SE	BAS	2023/07/13 12:00	46.71
6	BASF SE	BAS	2023/07/13 16:00	46.49
7	BASF SE	BAS	2023/07/14 10:00	46.01
8	BASF SE	BAS	2023/07/14 12:00	45.74
9	BASF SE	BAS	2023/07/14 16:00	45.58
10	BASF SE	BAS	2023/07/17 10:00	45.16
11	BASF SE	BAS	2023/07/17 12:00	44.98
12	BASF SE	BAS	2023/07/17 16:00	45.14
13	BASF SE	BAS	2023/07/18 10:00	45.81
14	BASF SE	BAS	2023/07/18 16:00	46.07
15	BASF SE	BAS	2023/07/18 12:00	46.31

Only BASF SE had stock prices between 40 and 50 EUR.

4. Sort the table by price. What are the minimum and maximum prices?

```
1. SELECT *
2. FROM stock
3. ORDER BY price;
```

id	name	symbol	datetime	price
35	Evonik Industries AG	EVK	2023/07/17 12:00	18.17
25	Evonik Industries AG	EVK	2023/07/12 10:00	18.18
34	Evonik Industries AG	EVK	2023/07/17 10:00	18.18
37	Evonik Industries AG	EVK	2023/07/18 10:00	18.22
36	Evonik Industries AG	EVK	2023/07/17 16:00	18.23
38	Evonik Industries AG	EVK	2023/07/18 16:00	18.27
33	Evonik Industries AG	EVK	2023/07/14 16:00	18.34
32	Evonik Industries AG	EVK	2023/07/14 12:00	18.42
39	Evonik Industries AG	EVK	2023/07/18 12:00	18.42
28	Evonik Industries AG	EVK	2023/07/13 10:00	18.46
26	Evonik Industries AG	EVK	2023/07/12 12:00	18.48
31	Evonik Industries AG	EVK	2023/07/14 10:00	18.52
27	Evonik Industries AG	EVK	2023/07/12 16:00	18.56
29	Evonik Industries AG	EVK	2023/07/13 12:00	18.61
30	Evonik Industries AG	EVK	2023/07/13 16:00	18.61

11	BASF SE	BAS	2023/07/17 12:00	44.98
12	BASF SE	BAS	2023/07/17 16:00	45.14
10	BASF SE	BAS	2023/07/17 10:00	45.16
9	BASF SE	BAS	2023/07/14 16:00	45.58
8	BASF SE	BAS	2023/07/14 12:00	45.74
13	BASF SE	BAS	2023/07/18 10:00	45.81
7	BASF SE	BAS	2023/07/14 10:00	46.01
14	BASF SE	BAS	2023/07/18 16:00	46.07
1	BASF SE	BAS	2023/07/12 10:00	46.31
15	BASF SE	BAS	2023/07/18 12:00	46.31
4	BASF SE	BAS	2023/07/13 10:00	46.35
6	BASF SE	BAS	2023/07/13 16:00	46.49
2	BASF SE	BAS	2023/07/12 12:00	46.67
5	BASF SE	BAS	2023/07/13 12:00	46.71
3	BASF SE	BAS	2023/07/12 16:00	47.02
46	Exxon Mobil Corp	XONA	2023/07/17 10:00	89.37
51	Exxon Mobil Corp	XONA	2023/07/18 12:00	89.43
47	Exxon Mobil Corp	XONA	2023/07/17 12:00	89.71
49	Exxon Mobil Corp	XONA	2023/07/18 10:00	89.9
48	Exxon Mobil Corp	XONA	2023/07/17 16:00	89.97
50	Exxon Mobil Corp	XONA	2023/07/18 16:00	90.36
61	3M Co	MMM	2023/07/18 10:00	90.4
62	3M Co	MMM	2023/07/18 16:00	90.51
60	3M Co	MMM	2023/07/17 16:00	90.65
54	3M Co	MMM	2023/07/13 16:00	90.96
58	3M Co	MMM	2023/07/17 10:00	91.0
45	Exxon Mobil Corp	XONA	2023/07/14 16:00	91.1
59	3M Co	MMM	2023/07/17 12:00	91.17
57	3M Co	MMM	2023/07/14 16:00	91.21
63	3M Co	MMM	2023/07/18 12:00	91.3
56	3M Co	MMM	2023/07/14 12:00	91.33
53	3M Co	MMM	2023/07/13 12:00	91.73
55	3M Co	MMM	2023/07/14 10:00	91.79
52	3M Co	MMM	2023/07/13 10:00	92.17
49	3M Co	MMM	2023/07/12 10:00	92.43
43	Exxon Mobil Corp	XONA	2023/07/14 10:00	92.69
50	3M Co	MMM	2023/07/12 12:00	92.7

44	Exxon Mobil Corp	XONA	2023/07/14 12:00	92.8
51	3M Co	MMM	2023/07/12 16:00	93.22
42	Exxon Mobil Corp	XONA	2023/07/13 16:00	93.8
41	Exxon Mobil Corp	XONA	2023/07/13 12:00	95.34
40	Exxon Mobil Corp	XONA	2023/07/13 10:00	95.72
37	Exxon Mobil Corp	XONA	2023/07/12 10:00	95.98
38	Exxon Mobil Corp	XONA	2023/07/12 12:00	96.15
39	Exxon Mobil Corp	XONA	2023/07/12 16:00	96.77
23	Solvay SA	SOLB	2023/07/17 12:00	101.45
24	Solvay SA	SOLB	2023/07/17 16:00	101.7
26	Solvay SA	SOLB	2023/07/18 16:00	101.7
27	Solvay SA	SOLB	2023/07/18 12:00	101.85
25	Solvay SA	SOLB	2023/07/18 10:00	101.9
22	Solvay SA	SOLB	2023/07/17 10:00	102.05
21	Solvay SA	SOLB	2023/07/14 16:00	103.5
20	Solvay SA	SOLB	2023/07/14 12:00	103.95
19	Solvay SA	SOLB	2023/07/14 10:00	104.25
13	Solvay SA	SOLB	2023/07/12 10:00	104.45
14	Solvay SA	SOLB	2023/07/12 12:00	105.05
16	Solvay SA	SOLB	2023/07/13 10:00	105.4
15	Solvay SA	SOLB	2023/07/12 16:00	105.85
18	Solvay SA	SOLB	2023/07/13 16:00	106.1
17	Solvay SA	SOLB	2023/07/13 12:00	106.2

When ordering by price, which is in default ascending order, Solvay SA had the highest stock price at 106.2 EUR at 12:00 PM on 2023/07/13. Evonik Industries AG, on the other hand, had the lowest stock price at 18.17 EUR at 12:00PM on 2023/07/17.

5. Explore using aggregate functions to look at key statistics about the data (e.g., min, max, average).

```
1. SELECT name, symbol, MIN(price)
2. FROM stock;
```

name	symbol	MIN(price)
Evonik Industries AG	EVK	18.17

```
1. SELECT name, symbol, MAX(price)
2. FROM stock;
```

name	symbol	MAX(price)
Solvay SA	SOLB	106.2

```

1. SELECT ROUND (AVG(price), 2) AS 'Average price' %SELECT ROUND() rounds
a number to a specified number of decimal places
2. FROM stock;

```

Average price
70.44

6. Group the data by stock and repeat. How do the stocks compare to each other?

```

1. SELECT name, symbol, MIN(price), MAX(price), ROUND(AVG(price),2) AS 'Average price',
2.     ROUND(MAX(price) - MIN(price), 2) AS 'Range'
3. FROM stock
4. GROUP BY symbol;

```

name	symbol	MIN(price)	MAX(price)	Average price	Range
BASF SE	BAS	44.98	47.02	46.02	2.04
Evonik Industries AG	EVK	18.17	18.61	18.38	0.44
3M Co	MMM	90.4	93.22	91.5	2.82
Solvay SA	SOLB	101.45	106.2	103.69	4.75
Exxon Mobil Corp	XONA	89.37	96.77	92.61	7.4

During this week, SOLB exhibited the highest average price among the five companies in the petrochemical/chemical manufacturing industry, while EK recorded lowest average price. XONA, on the other hand, demonstrated the highest range, indicating a significant fluctuation in its stock price, whereas EVK displayed the lowest range, implying greater stability.

BAS and MMM both showed a similar range, suggesting a relatively stable stock price throughout the week. As a result, based on this week's performance, BAS and MMM can be regarded as stronger and more stable companies compared to SOLB and XONA, which exhibit strength but higher fluctuations, making them potentially riskier options.

7. Group the data by day or hour of day. Does day of week or time of day impact prices?

```

1. SELECT *
2. FROM stock
3. WHERE datetime LIKE '%10:00'
4. ORDER BY symbol;

```

id	name	symbol	datetime	price
1	BASF SE	BAS	2023/07/12 10:00	46.31
4	BASF SE	BAS	2023/07/13 10:00	46.35
7	BASF SE	BAS	2023/07/14 10:00	46.01
10	BASF SE	BAS	2023/07/17 10:00	45.16
13	BASF SE	BAS	2023/07/18 10:00	45.81
25	Evonik Industries AG	EVK	2023/07/12 10:00	18.18
28	Evonik Industries AG	EVK	2023/07/13 10:00	18.46

31	Evonik Industries AG	EVK	2023/07/14 10:00	18.52
34	Evonik Industries AG	EVK	2023/07/17 10:00	18.18
37	Evonik Industries AG	EVK	2023/07/18 10:00	18.22
49	3M Co	MMM	2023/07/12 10:00	92.43
52	3M Co	MMM	2023/07/13 10:00	92.17
55	3M Co	MMM	2023/07/14 10:00	91.79
58	3M Co	MMM	2023/07/17 10:00	91.0
61	3M Co	MMM	2023/07/18 10:00	90.4
13	Solvay SA	SOLB	2023/07/12 10:00	104.45
16	Solvay SA	SOLB	2023/07/13 10:00	105.4
19	Solvay SA	SOLB	2023/07/14 10:00	104.25
22	Solvay SA	SOLB	2023/07/17 10:00	102.05
25	Solvay SA	SOLB	2023/07/18 10:00	101.9
37	Exxon Mobil Corp	XONA	2023/07/12 10:00	95.98
40	Exxon Mobil Corp	XONA	2023/07/13 10:00	95.72
43	Exxon Mobil Corp	XONA	2023/07/14 10:00	92.69
46	Exxon Mobil Corp	XONA	2023/07/17 10:00	89.37
49	Exxon Mobil Corp	XONA	2023/07/18 10:00	89.9

Here, the data is grouped by 10:00 AM each day, representing the market opening, to assess market sentiment and potential events impacting stock prices compared to the previous day.

Throughout the week, BAS experienced a price decline from 46.31 EUR to 45.81 EUR. On the other hand, EVK saw a slight gain, rising from 18.18 EUR to 18.22 EUR. MMM's stock price decreased from 92.43 EUR to 90.40 EUR, while SOLB declined from 104.45 EUR to 101.90 EUR. Similarly, XONA's stock price fell from 95.98 EUR to 89.90 EUR.

Overall, all companies in the industry, except EVK, recorded losses during the week, indicating a sense of pessimism among investors about the stocks' performance during this period.

8. Which of the rows have a price greater than the average of all prices in the dataset?

```
1. SELECT *
2. FROM stock
3. WHERE price > (SELECT AVG(price) FROM stock);
```

id	name	symbol	datetime	price
13	Solvay SA	SOLB	2023/07/12 10:00	104.45
14	Solvay SA	SOLB	2023/07/12 12:00	105.05
15	Solvay SA	SOLB	2023/07/12 16:00	105.85
16	Solvay SA	SOLB	2023/07/13 10:00	105.4
17	Solvay SA	SOLB	2023/07/13 12:00	106.2
18	Solvay SA	SOLB	2023/07/13 16:00	106.1
19	Solvay SA	SOLB	2023/07/14 10:00	104.25

20	Solvay SA	SOLB	2023/07/14 12:00	103.95
21	Solvay SA	SOLB	2023/07/14 16:00	103.5
22	Solvay SA	SOLB	2023/07/17 10:00	102.05
23	Solvay SA	SOLB	2023/07/17 12:00	101.45
24	Solvay SA	SOLB	2023/07/17 16:00	101.7
25	Solvay SA	SOLB	2023/07/18 10:00	101.9
26	Solvay SA	SOLB	2023/07/18 16:00	101.7
27	Solvay SA	SOLB	2023/07/18 12:00	101.85
37	Exxon Mobil Corp	XONA	2023/07/12 10:00	95.98
38	Exxon Mobil Corp	XONA	2023/07/12 12:00	96.15
39	Exxon Mobil Corp	XONA	2023/07/12 16:00	96.77
40	Exxon Mobil Corp	XONA	2023/07/13 10:00	95.72
41	Exxon Mobil Corp	XONA	2023/07/13 12:00	95.34
42	Exxon Mobil Corp	XONA	2023/07/13 16:00	93.8
43	Exxon Mobil Corp	XONA	2023/07/14 10:00	92.69
44	Exxon Mobil Corp	XONA	2023/07/14 12:00	92.8
45	Exxon Mobil Corp	XONA	2023/07/14 16:00	91.1
46	Exxon Mobil Corp	XONA	2023/07/17 10:00	89.37
47	Exxon Mobil Corp	XONA	2023/07/17 12:00	89.71
48	Exxon Mobil Corp	XONA	2023/07/17 16:00	89.97
49	Exxon Mobil Corp	XONA	2023/07/18 10:00	89.9
50	Exxon Mobil Corp	XONA	2023/07/18 16:00	90.36
51	Exxon Mobil Corp	XONA	2023/07/18 12:00	89.43
49	3M Co	MMM	2023/07/12 10:00	92.43
50	3M Co	MMM	2023/07/12 12:00	92.7
51	3M Co	MMM	2023/07/12 16:00	93.22
52	3M Co	MMM	2023/07/13 10:00	92.17
53	3M Co	MMM	2023/07/13 12:00	91.73
54	3M Co	MMM	2023/07/13 16:00	90.96
55	3M Co	MMM	2023/07/14 10:00	91.79
56	3M Co	MMM	2023/07/14 12:00	91.33
57	3M Co	MMM	2023/07/14 16:00	91.21
58	3M Co	MMM	2023/07/17 10:00	91.0
59	3M Co	MMM	2023/07/17 12:00	91.17
60	3M Co	MMM	2023/07/17 16:00	90.65
61	3M Co	MMM	2023/07/18 10:00	90.4
62	3M Co	MMM	2023/07/18 16:00	90.51
63	3M Co	MMM	2023/07/18 12:00	91.3

63 / 75 rows have a price greater than the average of all prices.

9. In addition to the built-in aggregate functions, explore ways to calculate other key statistics about data, such as the median or variance.

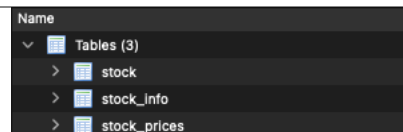
```
1. SELECT name, symbol, price
2. FROM stock
3. ORDER BY price
4. LIMIT 1 /* LIMIT restricts how many rows a query returns */
5. OFFSET (SELECT COUNT(*) FROM stock)/2;
6. /*OFFSET() dictates the number of rows to skip from the beginning of the returned data before
presenting the results*/
7. /* SELECT COUNT(*) returns the total number of rows in a table including the NULLs*/
```

name	symbol	price
3M Co	MMM	90.51

The median price in the data is 90.51 EUR.

10. Refactor the data into 2 tables – stock_info to store general info about the stock itself (ie. Symbol, name) and stock_prices to store the collected data on price (ie. Symbol, datetime, price).

```
1. CREATE TABLE stock_info AS
2. SELECT id, symbol, name
3. FROM stock;
4.
5. CREATE TABLE stock_prices AS
6. SELECT id, symbol, datetime, price
7. FROM stock;
```



11. Join the two tables in order to view more information on the stock with each row price.

```
1. SELECT *
2. FROM stock_info
3. JOIN stock_prices /*JOIN combines records from two or more tables in a database*/
4. ON stock_info.id = stock_prices.id; /*ON specifies joining conditions - in this case, tables
joined by matching the id column */
```

id	symbol	name	id	symbol	datetime	price
1	BAS	BASF SE	1	BAS	2023/07/12 10:00	46.31
2	BAS	BASF SE	2	BAS	2023/07/12 12:00	46.67
3	BAS	BASF SE	3	BAS	2023/07/12 16:00	47.02
4	BAS	BASF SE	4	BAS	2023/07/13 10:00	46.35
5	BAS	BASF SE	5	BAS	2023/07/13 12:00	46.71
6	BAS	BASF SE	6	BAS	2023/07/13 16:00	46.49
7	BAS	BASF SE	7	BAS	2023/07/14 10:00	46.01
8	BAS	BASF SE	8	BAS	2023/07/14 12:00	45.74
9	BAS	BASF SE	9	BAS	2023/07/14 16:00	45.58
10	BAS	BASF SE	10	BAS	2023/07/17 10:00	45.16
11	BAS	BASF SE	11	BAS	2023/07/17 12:00	44.98
12	BAS	BASF SE	12	BAS	2023/07/17 16:00	45.14
13	BAS	BASF SE	13	BAS	2023/07/18 10:00	45.81

13	BAS	BASF SE	13	SOLB	2023/07/12 10:00	104.45
14	BAS	BASF SE	14	BAS	2023/07/18 16:00	46.07
14	BAS	BASF SE	14	SOLB	2023/07/12 12:00	105.05
15	BAS	BASF SE	15	BAS	2023/07/18 12:00	46.31
15	BAS	BASF SE	15	SOLB	2023/07/12 16:00	105.85
13	SOLB	Solvay SA	13	BAS	2023/07/18 10:00	45.81
13	SOLB	Solvay SA	13	SOLB	2023/07/12 10:00	104.45
14	SOLB	Solvay SA	14	BAS	2023/07/18 16:00	46.07
14	SOLB	Solvay SA	14	SOLB	2023/07/12 12:00	105.05
15	SOLB	Solvay SA	15	BAS	2023/07/18 12:00	46.31
15	SOLB	Solvay SA	15	SOLB	2023/07/12 16:00	105.85
16	SOLB	Solvay SA	16	SOLB	2023/07/13 10:00	105.4
17	SOLB	Solvay SA	17	SOLB	2023/07/13 12:00	106.2
18	SOLB	Solvay SA	18	SOLB	2023/07/13 16:00	106.1
19	SOLB	Solvay SA	19	SOLB	2023/07/14 10:00	104.25
20	SOLB	Solvay SA	20	SOLB	2023/07/14 12:00	103.95
21	SOLB	Solvay SA	21	SOLB	2023/07/14 16:00	103.5
22	SOLB	Solvay SA	22	SOLB	2023/07/17 10:00	102.05
23	SOLB	Solvay SA	23	SOLB	2023/07/17 12:00	101.45
24	SOLB	Solvay SA	24	SOLB	2023/07/17 16:00	101.7
25	SOLB	Solvay SA	25	EVK	2023/07/12 10:00	18.18
25	SOLB	Solvay SA	25	SOLB	2023/07/18 10:00	101.9
26	SOLB	Solvay SA	26	EVK	2023/07/12 12:00	18.48
26	SOLB	Solvay SA	26	SOLB	2023/07/18 16:00	101.7
27	SOLB	Solvay SA	27	EVK	2023/07/12 16:00	18.56
27	SOLB	Solvay SA	27	SOLB	2023/07/18 12:00	101.85
25	EVK	Evonik Industries AG	25	EVK	2023/07/12 10:00	18.18
25	EVK	Evonik Industries AG	25	SOLB	2023/07/18 10:00	101.9
26	EVK	Evonik Industries AG	26	EVK	2023/07/12 12:00	18.48
26	EVK	Evonik Industries AG	26	SOLB	2023/07/18 16:00	101.7
27	EVK	Evonik Industries AG	27	EVK	2023/07/12 16:00	18.56
27	EVK	Evonik Industries AG	27	SOLB	2023/07/18 12:00	101.85
28	EVK	Evonik Industries AG	28	EVK	2023/07/13 10:00	18.46
29	EVK	Evonik Industries AG	29	EVK	2023/07/13 12:00	18.61
30	EVK	Evonik Industries AG	30	EVK	2023/07/13 16:00	18.61
31	EVK	Evonik Industries AG	31	EVK	2023/07/14 10:00	18.52
32	EVK	Evonik Industries AG	32	EVK	2023/07/14 12:00	18.42
33	EVK	Evonik Industries AG	33	EVK	2023/07/14 16:00	18.34
34	EVK	Evonik Industries AG	34	EVK	2023/07/17 10:00	18.18
35	EVK	Evonik Industries AG	35	EVK	2023/07/17 12:00	18.17

36	EVK	Evonik Industries AG	36	EVK	2023/07/17 16:00	18.23
37	EVK	Evonik Industries AG	37	EVK	2023/07/18 10:00	18.22
37	EVK	Evonik Industries AG	37	XONA	2023/07/12 10:00	95.98
38	EVK	Evonik Industries AG	38	EVK	2023/07/18 16:00	18.27
38	EVK	Evonik Industries AG	38	XONA	2023/07/12 12:00	96.15
39	EVK	Evonik Industries AG	39	EVK	2023/07/18 12:00	18.42
39	EVK	Evonik Industries AG	39	XONA	2023/07/12 16:00	96.77
37	XONA	Exxon Mobil Corp	37	EVK	2023/07/18 10:00	18.22
37	XONA	Exxon Mobil Corp	37	XONA	2023/07/12 10:00	95.98
38	XONA	Exxon Mobil Corp	38	EVK	2023/07/18 16:00	18.27
38	XONA	Exxon Mobil Corp	38	XONA	2023/07/12 12:00	96.15
39	XONA	Exxon Mobil Corp	39	EVK	2023/07/18 12:00	18.42
39	XONA	Exxon Mobil Corp	39	XONA	2023/07/12 16:00	96.77
40	XONA	Exxon Mobil Corp	40	XONA	2023/07/13 10:00	95.72
41	XONA	Exxon Mobil Corp	41	XONA	2023/07/13 12:00	95.34
42	XONA	Exxon Mobil Corp	42	XONA	2023/07/13 16:00	93.8
43	XONA	Exxon Mobil Corp	43	XONA	2023/07/14 10:00	92.69
44	XONA	Exxon Mobil Corp	44	XONA	2023/07/14 12:00	92.8
45	XONA	Exxon Mobil Corp	45	XONA	2023/07/14 16:00	91.1
46	XONA	Exxon Mobil Corp	46	XONA	2023/07/17 10:00	89.37
47	XONA	Exxon Mobil Corp	47	XONA	2023/07/17 12:00	89.71
48	XONA	Exxon Mobil Corp	48	XONA	2023/07/17 16:00	89.97
49	XONA	Exxon Mobil Corp	49	MMM	2023/07/12 10:00	92.43
49	XONA	Exxon Mobil Corp	49	XONA	2023/07/18 10:00	89.9
50	XONA	Exxon Mobil Corp	50	MMM	2023/07/12 12:00	92.7
50	XONA	Exxon Mobil Corp	50	XONA	2023/07/18 16:00	90.36
51	XONA	Exxon Mobil Corp	51	MMM	2023/07/12 16:00	93.22
51	XONA	Exxon Mobil Corp	51	XONA	2023/07/18 12:00	89.43
49	MMM	3M Co	49	MMM	2023/07/12 10:00	92.43
49	MMM	3M Co	49	XONA	2023/07/18 10:00	89.9
50	MMM	3M Co	50	MMM	2023/07/12 12:00	92.7
50	MMM	3M Co	50	XONA	2023/07/18 16:00	90.36
51	MMM	3M Co	51	MMM	2023/07/12 16:00	93.22
51	MMM	3M Co	51	XONA	2023/07/18 12:00	89.43
52	MMM	3M Co	52	MMM	2023/07/13 10:00	92.17
53	MMM	3M Co	53	MMM	2023/07/13 12:00	91.73
54	MMM	3M Co	54	MMM	2023/07/13 16:00	90.96
55	MMM	3M Co	55	MMM	2023/07/14 10:00	91.79
56	MMM	3M Co	56	MMM	2023/07/14 12:00	91.33
57	MMM	3M Co	57	MMM	2023/07/14 16:00	91.21

58	MMM	3M Co	58	MMM	2023/07/17 10:00	91.0
59	MMM	3M Co	59	MMM	2023/07/17 12:00	91.17
60	MMM	3M Co	60	MMM	2023/07/17 16:00	90.65
61	MMM	3M Co	61	MMM	2023/07/18 10:00	90.4
62	MMM	3M Co	62	MMM	2023/07/18 16:00	90.51
63	MMM	3M Co	63	MMM	2023/07/18 12:00	91.3

12. Add more variables to the stock_info table and update the data (e.g., sector, industry, etc.)

```

1. SELECT *,
2. CASE
3. WHEN symbol = 'BAS' THEN 'Chemical'
4. WHEN symbol = 'SOLB' THEN 'Chemical'
5. WHEN symbol = 'EVK' THEN 'Semiconductor'
6. WHEN symbol = 'MMM' THEN 'Industrial'
7. WHEN symbol = 'XONA' THEN 'Biotech'
8. ELSE 'Other'
9. END AS 'Sector'
10. FROM stock_info;

```

id	symbol	name	Sector
1	BAS	BASF SE	Chemical
2	BAS	BASF SE	Chemical
3	BAS	BASF SE	Chemical
4	BAS	BASF SE	Chemical
5	BAS	BASF SE	Chemical
6	BAS	BASF SE	Chemical
7	BAS	BASF SE	Chemical
8	BAS	BASF SE	Chemical
9	BAS	BASF SE	Chemical
10	BAS	BASF SE	Chemical
11	BAS	BASF SE	Chemical
12	BAS	BASF SE	Chemical
13	BAS	BASF SE	Chemical
14	BAS	BASF SE	Chemical
15	BAS	BASF SE	Chemical
13	SOLB	Solvay SA	Chemical
14	SOLB	Solvay SA	Chemical
15	SOLB	Solvay SA	Chemical
16	SOLB	Solvay SA	Chemical
17	SOLB	Solvay SA	Chemical
18	SOLB	Solvay SA	Chemical
19	SOLB	Solvay SA	Chemical
20	SOLB	Solvay SA	Chemical
21	SOLB	Solvay SA	Chemical

22	SOLB	Solvay SA	Chemical
23	SOLB	Solvay SA	Chemical
24	SOLB	Solvay SA	Chemical
25	SOLB	Solvay SA	Chemical
26	SOLB	Solvay SA	Chemical
27	SOLB	Solvay SA	Chemical
25	EVK	Evonik Industries AG	Semiconductor
26	EVK	Evonik Industries AG	Semiconductor
27	EVK	Evonik Industries AG	Semiconductor
28	EVK	Evonik Industries AG	Semiconductor
29	EVK	Evonik Industries AG	Semiconductor
30	EVK	Evonik Industries AG	Semiconductor
31	EVK	Evonik Industries AG	Semiconductor
32	EVK	Evonik Industries AG	Semiconductor
33	EVK	Evonik Industries AG	Semiconductor
34	EVK	Evonik Industries AG	Semiconductor
35	EVK	Evonik Industries AG	Semiconductor
36	EVK	Evonik Industries AG	Semiconductor
37	EVK	Evonik Industries AG	Semiconductor
38	EVK	Evonik Industries AG	Semiconductor
39	EVK	Evonik Industries AG	Semiconductor
37	XONA	Exxon Mobil Corp	Biotech
38	XONA	Exxon Mobil Corp	Biotech
39	XONA	Exxon Mobil Corp	Biotech
40	XONA	Exxon Mobil Corp	Biotech
41	XONA	Exxon Mobil Corp	Biotech
42	XONA	Exxon Mobil Corp	Biotech
43	XONA	Exxon Mobil Corp	Biotech
44	XONA	Exxon Mobil Corp	Biotech
45	XONA	Exxon Mobil Corp	Biotech
46	XONA	Exxon Mobil Corp	Biotech
47	XONA	Exxon Mobil Corp	Biotech
48	XONA	Exxon Mobil Corp	Biotech
49	XONA	Exxon Mobil Corp	Biotech
50	XONA	Exxon Mobil Corp	Biotech
51	XONA	Exxon Mobil Corp	Biotech
49	MMM	3M Co	Industrial
50	MMM	3M Co	Industrial
51	MMM	3M Co	Industrial
52	MMM	3M Co	Industrial

53	MMM	3M Co	Industrial
54	MMM	3M Co	Industrial
55	MMM	3M Co	Industrial
56	MMM	3M Co	Industrial
57	MMM	3M Co	Industrial
58	MMM	3M Co	Industrial
59	MMM	3M Co	Industrial
60	MMM	3M Co	Industrial
61	MMM	3M Co	Industrial
62	MMM	3M Co	Industrial
63	MMM	3M Co	Industrial