# DSCI 560 Lab 3 Report

## Group Code Submission Link:

https://github.com/shubhamdarekar/DSCI560---Shubham/tree/main/Lab_3

## Code README:

DSCI560---Shubham/Lab_3/README.md at main · shubhamdarekar/DSCI560---Shubham

## Meeting Notes Link:

https://docs.google.com/document/d/1Yx0zCHnpvug2czdTALt-7H9Z32BcRcTYsCPhUPD4qEw/edit?usp=sharing

## Team Details: Group 1

Saavani Vaidya 9385579920
Yuxuan Liu 4780355176
Shubham Darekar 1641138809

## Task 1: Database Installation and Configuration

Console:

```
shubhamdarekar@shubham-darekar-DSCI560:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 29
Server version: 8.0.40-0ubuntu0.24.04.1 (Ubuntu)

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| DSCI560_Stocks     |
| information_schema |
| mysql              |
| performance_schema |
| phpmyadmin         |
| sys                |
+--------------------+
6 rows in set (0.00 sec)

mysql>
```
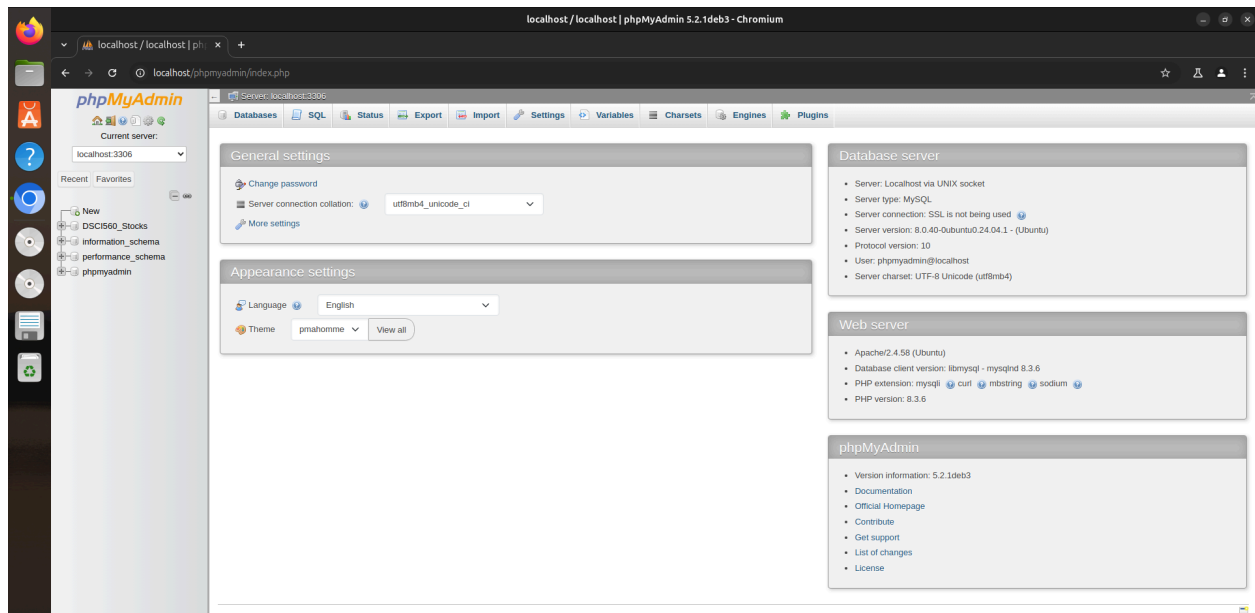
phpMyAdmin:



## Task 2: Technologies Used

Database Storage: MySQL
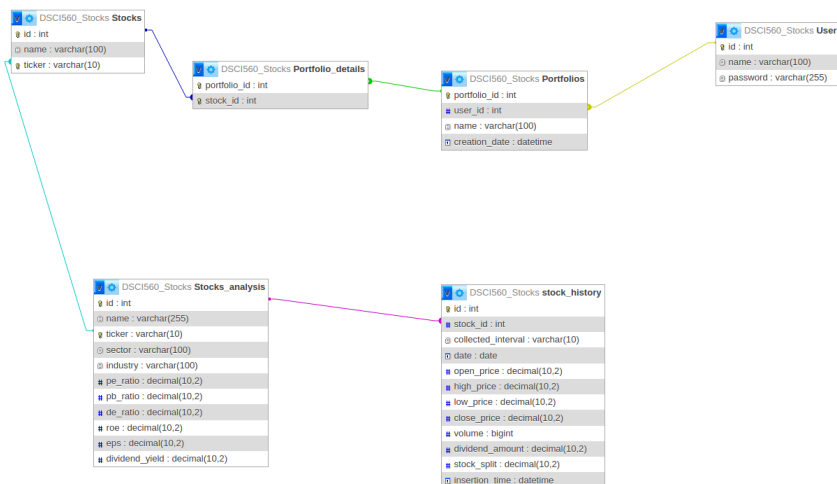Database Interface: phpMyAdmin
Scraping: Python and yFinancepytho
Environment:

## Task 3: Data Collection / Storage

### Database Schema:

```
 1   Users:
 2       Id
 3       Name
 4       Password
 5
 6   Portfolios:
 7       portfolio_id
 8       user_id
 9       name
10       creation_date
11
12   Portfolio_details:
13       portfolio_id
14       stock_id
15
16   Stocks_analysis:
17       id
18       name
19       ticker
20       sector
21       industry
22       pe_ratio
23       pb_ratio
24       de_ratio
25       roe
26       eps
27       dividend_yield
28
29
30   stock_history:
31       stock_id,
32       date,
33       open_price,
34       high_price,
35       low_price,
36       close_price,
37       volume,
38       dividend_amount,
39       stock_split
40
```

**DSCI560_Stocks Stocks**
- id : int
- name : varchar(100)
- ticker : varchar(10)

**DSCI560_Stocks Portfolio_details**
- portfolio_id : int
- stock_id : int

**DSCI560_Stocks Portfolios**
- portfolio_id : int
- user_id : int
- name : varchar(100)
- creation_date : datetime

**DSCI560_Stocks Users**
- id : int
- name : varchar(100)
- password : varchar(255)

**DSCI560_Stocks Stocks_analysis**
- id : int
- name : varchar(255)
- ticker : varchar(10)
- sector : varchar(100)
- industry : varchar(100)
- pe_ratio : decimal(10,2)
- pb_ratio : decimal(10,2)
- de_ratio : decimal(10,2)
- roe : decimal(10,2)
- eps : decimal(10,2)
- dividend_yield : decimal(10,2)

**DSCI560_Stocks stock_history**
- id : int
- stock_id : int
- collected_interval : varchar(10)
- date : date
- open_price : decimal(10,2)
- high_price : decimal(10,2)
- low_price : decimal(10,2)
- close_price : decimal(10,2)
- volume : bigint
- dividend_amount : decimal(10,2)
- stock_split : decimal(10,2)
- insertion_time : datetime

**Functions:**

1. Create a new user

```
(.venv) shubhamdarekar@shubham-darekar-DSCI560:~/DSCI560---Shubham$ python3 Lab_3/scripts/scrape_stocks.py
Database initialized successfully


1. Create User
2. Login
3. Exit
Enter your choice: 1
Enter your username: grace
Create new password: Grace@123
User created successfully
```

2. Login

```
1. Create User
2. Login
3. Exit
Enter your choice: 2
Enter your username: grace
Enter your password: Grace@123
Logged in successfully
```

3. User password and name validation

```
1. Create User
2. Login
3. Exit
Enter your choice: 2
Enter your username: graceL
User does not exist



1. Create User
2. Login
3. Exit
Enter your choice: 2
Enter your username: grace
Enter your password: 1234
Invalid password
```

4. Create a new portfolio

```
1. Create Portfolio
2. Select Existing Portfolio
3. Logout
Enter your choice: 1
Enter portfolio name: Big Pharma
Portfolio created successfully
```

5. Select and list stocks in portfolio

```
1. Create Portfolio
2. Select Existing Portfolio
3. Logout
Enter your choice: 2
Select a portfolio
1. Big Pharma
Enter your choice: 1


No stocks in portfolio Big Pharma
Stocks in Portfolio Big Pharma


 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice:
```

6. Add stock to portfolio

```
 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice: 1
Enter ticker name: PFE
Stock added successfully




Stocks in Portfolio Big Pharma
1. Pfizer, Inc.


 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice: 1
Enter ticker name: JNJ
Stock added successfully




Stocks in Portfolio Big Pharma
1. Pfizer, Inc.
2. Johnson & Johnson


 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice:
```

7. Delete stock from portfolio

```
 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice: 1
Enter ticker name: JNJ
Stock added successfully



Stocks in Portfolio Big Pharma
1. Pfizer, Inc.
2. Johnson & Johnson


 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice: 2
Enter stock number to delete: 1
Stock deleted from portfolio successfully



Stocks in Portfolio Big Pharma
1. Johnson & Johnson


 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice:
```

8. Stocks ticker validation

```
 Operations
1. Add Stock
2. Delete Stocks
3. Go to previous menu
Enter your choice: 1
Enter ticker name: Abek
404 Client Error: Not Found for url: https://query2.finance.yahoo.com/v10/finance/quote
ail&corsDomain=finance.yahoo.com&formatted=false&symbol=ABEK&crumb=dCeQikO2Al0
Ticker not recognized
```

9. Fetch the stock price data for an input date range and save it to database

```
Stocks in Portfolio Big Pharma
1. Pfizer, Inc.
2. Johnson & Johnson
3. AbbVie Inc.


 Operations
1. Add Stock
2. Delete Stocks
3. Show/Save Stock History
4. Go to previous menu
Enter your choice: 3
Enter period (1d, 1mo, 1y, 5y): 3d
Enter interval (1d, 1wk, 1mo): 1d



Saved_history of Stocks:  PFE  Period:  3d  Interval:  1d
Stock:  PFE  Period:  3d  Interval:  1d History saved in db, showing first 5 rows
                            Open    High    Low     Close    Volume  Dividends  Stock Splits
Date
2025-01-29 00:00:00-05:00  26.799999  27.07  26.57  26.620001  34418200       0.0           0.0
2025-01-30 00:00:00-05:00  26.660000  27.01  26.58  26.910000  32289600       0.0           0.0
2025-01-31 00:00:00-05:00  26.959999  27.01  26.42  26.520000  37269448       0.0           0.0



Saved_history of Stocks:  JNJ  Period:  3d  Interval:  1d
Stock:  JNJ  Period:  3d  Interval:  1d History saved in db, showing first 5 rows
                            Open        High         Low         Close     Volume  Dividends  Stock Splits
Date
2025-01-29 00:00:00-05:00  150.500000  151.880005  150.000000  151.149994  7156400       0.0           0.0
2025-01-30 00:00:00-05:00  151.910004  154.139999  151.360001  152.869995  8911000       0.0           0.0
2025-01-31 00:00:00-05:00  152.619995  153.179993  152.054993  152.149994  5281291       0.0           0.0



Saved_history of Stocks:  ABBV  Period:  3d  Interval:  1d
Stock:  ABBV  Period:  3d  Interval:  1d History saved in db, showing first 5 rows
                            Open        High         Low         Close     Volume  Dividends  Stock Splits
Date
2025-01-29 00:00:00-05:00  174.500000  176.919998  174.300003  175.259995  3748300       0.0           0.0
2025-01-30 00:00:00-05:00  176.009995  176.119995  173.979996  175.649994  5209200       0.0           0.0
2025-01-31 00:00:00-05:00  187.300003  191.735001  183.669998  183.899994  9434227       0.0           0.0
```

## Task 4: Data Preprocessing

1. Converting Date Format: Converted date column into a proper datetime format. Ensured chronological sorting by stock_id and date.

2. Handling Missing Values: Used forward fill to fill missing values based on previous data. Used backward fill as a backup for remaining missing values. Dropped any rows where NaN values still remained.

3. Feature Engineering:
        Daily Return (daily_return): Measures percentage change in closing price.

Log Return (log_return): More stable alternative to percentage change.
Moving Averages (5-day & 20-day): Identifies short-term and long-term trends.
Volatility (5-day standard deviation of daily returns): Measures risk.
Cumulative Return (cumulative_return): Helps analyze overall trends.
Volume Change Percentage (volume_change): Detects shifts in trading activity.

**stock_history**

| id | stock_id | collected_interval | date | open_price | high_price | low_price | close_price | volume | dividend_amount | stock_split | insertion_time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1d | 2024-01-31 | 186.13 | 186.19 | 183.45 | 183.50 | 55467800 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 2 | 1 | 1d | 2024-02-01 | 183.09 | 186.04 | 182.92 | 185.95 | 64885400 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 3 | 1 | 1d | 2024-02-02 | 178.98 | 186.42 | 178.38 | 184.94 | 102518000 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 4 | 1 | 1d | 2024-02-05 | 187.23 | 188.33 | 184.93 | 186.77 | 69668800 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 5 | 1 | 1d | 2024-02-06 | 185.95 | 188.39 | 185.86 | 188.38 | 43490800 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 6 | 1 | 1d | 2024-02-07 | 189.71 | 190.12 | 187.69 | 188.49 | 53439000 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 7 | 1 | 1d | 2024-02-08 | 188.47 | 188.62 | 186.44 | 187.40 | 40962000 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 8 | 1 | 1d | 2024-02-09 | 187.97 | 189.31 | 187.32 | 188.17 | 45155200 | 0.24 | 0.00 | 2025-01-31 09:40:31 |
| 9 | 1 | 1d | 2024-02-12 | 187.74 | 187.99 | 186.12 | 186.48 | 41781900 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 10 | 1 | 1d | 2024-02-13 | 185.10 | 185.54 | 182.85 | 184.37 | 56529500 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 11 | 1 | 1d | 2024-02-14 | 184.65 | 184.86 | 181.78 | 183.49 | 54630500 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 12 | 1 | 1d | 2024-02-15 | 182.89 | 183.82 | 180.70 | 183.20 | 65434500 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 13 | 1 | 1d | 2024-02-16 | 182.76 | 184.18 | 181.02 | 181.65 | 49701400 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 14 | 1 | 1d | 2024-02-20 | 181.13 | 181.77 | 179.35 | 180.91 | 53665600 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 15 | 1 | 1d | 2024-02-21 | 181.28 | 182.23 | 180.01 | 181.66 | 41529700 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 16 | 1 | 1d | 2024-02-22 | 182.82 | 184.29 | 181.80 | 183.71 | 52292200 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 17 | 1 | 1d | 2024-02-23 | 184.34 | 184.37 | 181.57 | 181.86 | 45119700 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 18 | 1 | 1d | 2024-02-26 | 181.58 | 182.10 | 180.00 | 180.51 | 40867400 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 19 | 1 | 1d | 2024-02-27 | 180.45 | 183.26 | 178.91 | 181.97 | 54318900 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 20 | 1 | 1d | 2024-02-28 | 181.85 | 182.46 | 179.48 | 180.77 | 48953900 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 21 | 1 | 1d | 2024-02-29 | 180.62 | 181.91 | 178.88 | 180.10 | 136682600 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 22 | 1 | 1d | 2024-03-01 | 178.90 | 179.88 | 176.74 | 179.01 | 73488000 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 23 | 1 | 1d | 2024-03-04 | 175.51 | 176.26 | 173.16 | 174.47 | 81510100 | 0.00 | 0.00 | 2025-01-31 09:40:31 |
| 24 | 1 | 1d | 2024-03-05 | 170.14 | 171.42 | 169.01 | 169.51 | 95132400 | 0.00 | 0.00 | 2025-01-31 09:40:31 |

**processed_stock_history**

| id | stock_id | collected_interval | date | open_price | high_price | low_price | close_price | volume | dividend_amount | stock_split | insertion_time | daily_return | log_return | moving_avg_5d | moving_avg_20d | volatility_5d | cumulative_return | volume_change |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1d | 2024-01-31 | 186.13 | 186.19 | 183.5 | 183.5 | 55467800 | 0.0 | 0.0 | 2025-01-31 09:40:31 | | | | | | | |
| 2 | 1 | 1d | 2024-02-01 | 183.09 | 186.04 | 182.92 | 185.95 | 64885400 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.01335149863760220 | 0.013263152876454100 | | | | 0.01335149863760220 | 0.1697849923739540 |
| 3 | 1 | 1d | 2024-02-02 | 178.98 | 186.42 | 178.38 | 184.94 | 102518000 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0054315676257057400 | -0.0054463722215862900 | | | | 0.007919931011896480 | 0.5799856362140020 |
| 4 | 1 | 1d | 2024-02-05 | 187.23 | 188.33 | 184.93 | 186.77 | 69668800 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0098951011138474820 | 0.0098464651760231120 | | | | 0.0178150321257713.0 | -0.3204237304668450 |
| 5 | 1 | 1d | 2024-02-06 | 185.95 | 188.39 | 185.86 | 188.38 | 43490800 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0086202280880225.40 | 0.0085832860069155270 | 185.908 | | | 0.0264352602137938.00 | -0.3757492593528240 |
| 6 | 1 | 1d | 2024-02-07 | 189.71 | 190.12 | 187.69 | 188.49 | 53439000 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.00058392610680546.60 | 0.00058375568829434.60 | 186.906 | | 0.0076537488346986.600 | 0.0270191863205993.00 | 0.2287426306252280 |
| 7 | 1 | 1d | 2024-02-08 | 188.47 | 188.62 | 186.44 | 187.4 | 40962000 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0057828001485490.40 | -0.0057999585278643.570 | 187.196 | | 0.0077467776479415.4600 | 0.0212363861720503.0 | -0.2334811654409700 |
| 8 | 1 | 1d | 2024-02-09 | 187.97 | 189.31 | 187.32 | 188.17 | 45155200 | 0.24 | 0.0 | 2025-01-31 09:40:31 | 0.0041088580576307.300 | 0.0041004397522313.20 | 187.842 | | 0.0063670541066843.70 | 0.0253452442296810.00 | 0.1023680484351350 |
| 9 | 1 | 1d | 2024-02-12 | 187.74 | 187.99 | 186.12 | 186.48 | 41781900 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0089812403677526.10 | -0.0092181482905149.0 | 187.78400000000000 | | 0.0071626527212760.40 | 0.0163684003861928.400 | -0.0747045744454681.0 |
| 10 | 1 | 1d | 2024-02-13 | 185.1 | 185.54 | 182.85 | 184.37 | 56529500 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0113148863148862.00 | -0.0113793866452022.00 | 186.98200000000000 | | 0.0064784329321148.70 | 0.0050491175470421.80 | 0.352966236576125 |
| 11 | 1 | 1d | 2024-02-14 | 184.65 | 184.86 | 181.78 | 183.49 | 54630500 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0047730107935130.000 | -0.0047844379854371.40 | 185.98200000000000 | | 0.0058897367098798.0 | 0.0002761067535291.820 | -0.0335930797194.3850 |
| 12 | 1 | 1d | 2024-02-15 | 182.89 | 183.82 | 180.7 | 183.2 | 65434500 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0015804676004143.000 | -0.0015817178568324.400 | 185.142 | | 0.0061080786675624.70 | -0.0013043684688512.0 | 0.1977649847612600 |
| 13 | 1 | 1d | 2024-02-16 | 182.76 | 184.18 | 181.02 | 181.65 | 49701400 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0084606986899562.50 | -0.0084966935728188.60 | 183.838 | | 0.0038407543835759.500 | -0.0097650595368413.7 | -0.2404040440404000 |
| 14 | 1 | 1d | 2024-02-20 | 181.13 | 181.77 | 179.35 | 180.91 | 53665600 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0040737682356180.00 | -0.0040820886340412.30 | 182.72400000000000 | | 0.0038419709916419.50 | -0.0138388277724594.00 | 0.0797603268289430 |
| 15 | 1 | 1d | 2024-02-21 | 181.28 | 182.23 | 180.01 | 181.66 | 41529700 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0041457078105136.00 | 0.0041371380408978.00 | 182.182 | | 0.0046684767249762.50 | -0.0096931199619457.70 | -0.2261392773024060 |
| 16 | 1 | 1d | 2024-02-22 | 182.82 | 184.29 | 181.8 | 183.71 | 52292200 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0112848177914786.00 | 0.0112216192467783.00 | 182.22600000000000 | | 0.0076626486552772.70 | 0.0015916978295328.300 | 0.2591518840733260 |
| 17 | 1 | 1d | 2024-02-23 | 184.34 | 184.37 | 181.57 | 181.86 | 45119700 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0100702193674813.00 | -0.0101212670230789.00 | 181.958 | | 0.0089976193737378.0760 | -0.0084785215379484.8 | -0.137161947670972 |
| 18 | 1 | 1d | 2024-02-26 | 181.58 | 182.1 | 180.0 | 180.51 | 40867400 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0074232926426922.600 | -0.0074509823973.9679 | 181.73000000000000 | | 0.0088050018985114.70 | 0.0088050018985114.70 | -0.0942448642167391.0 |
| 19 | 1 | 1d | 2024-02-27 | 180.45 | 183.26 | 178.91 | 181.97 | 54318900 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0080881945598583.2 | 0.0080556604247.81390 | 181.94200000000000 | | 0.0094763767098662.90 | -0.0078136196207824.2 | 0.3291498847492130 |
| 20 | 1 | 1d | 2024-02-28 | 181.85 | 182.46 | 179.48 | 180.77 | 48953900 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0065944935978547.00 | -0.0066163333838.8200 | 181.76400000000000 | | 0.0098529400323349.5 | -0.0144081321862810.0 | -0.0978656858294260 |
| 21 | 1 | 1d | 2024-02-29 | 180.62 | 181.91 | 178.88 | 180.1 | 136682600 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0037083672069481.70 | -0.0037132528045.27200 | 181.04200000000000 | 184.03900000000000 | 0.0070973814609105.70 | -0.0181144804025576.300 | 1.7920676391462200 |
| 22 | 1 | 1d | 2024-03-01 | 178.9 | 179.88 | 176.74 | 179.01 | 73488000 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0060521932259856.00 | -0.0060705819798.1022 | 180.47200000000000 | 183.692 | 0.0084256145246706.00 | -0.0241666736515619.00 | -0.4623456094630920 |
| 23 | 1 | 1d | 2024-03-04 | 175.51 | 176.26 | 173.16 | 174.47 | 81510100 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0253617116336214.00 | -0.0256888631102.89700 | 179.26400000000000 | 183.1685 | 0.0120035369579310.00 | -0.0496283852877833.0 | 0.1091620400609620 |
| 24 | 1 | 1d | 2024-03-05 | 170.14 | 171.42 | 169.01 | 169.51 | 95132400 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0284289562675532.0 | -0.0288408849614.15500 | 176.772 | 182.3055 | 0.0118453379053845.00 | -0.0779573415553364 | 0.1671240741944860 |
| 25 | 1 | 1d | 2024-03-06 | 170.44 | 170.62 | 168.07 | 168.51 | 68587700 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0058993569700902.50 | -0.0059168269179.43880 | 172.44 | 181.31200000000000 | 0.0119579407166966.00 | -0.0838566698525426.70 | -0.2790290164024030 |
| 26 | 1 | 1d | 2024-03-07 | 168.54 | 170.11 | 167.88 | 168.39 | 71765100 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0007121239095603.250 | -0.0007123775902.334740 | 171.978 | 180.307 | 0.0126503422203545.00 | -0.0845688224349870.0 | 0.0463260905380993 |
| 27 | 1 | 1d | 2024-03-08 | 168.39 | 173.07 | 168.33 | 170.11 | 76114600 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0102143832769168.00 | 0.0101625889927.74000 | 170.198 | 179.44250000000000 | 0.0164871371766365.00 | -0.0743544391580702.0 | 0.0606074540410311.0 |
| 28 | 1 | 1d | 2024-03-11 | 172.32 | 173.75 | 171.43 | 172.13 | 60139500 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0118746693316087.00 | 0.0118047186619.22800 | 169.73 | 178.6405 | 0.0162427584845881 | -0.0624797698266414.0 | -0.2098822039398490 |
| 29 | 1 | 1d | 2024-03-12 | 172.53 | 173.4 | 170.39 | 173.17 | 59825400 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0027885900191717.60 | 0.0027847091151.835500 | 170.35 | 177.947 | 0.0074447402889521.70 | -0.0596911798072897.0 | -0.0522285685780555 |
| 30 | 1 | 1d | 2024-03-13 | 172.15 | 172.57 | 170.14 | 170.51 | 52488700 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0121661549157061.00 | -0.0122407683658.53700 | 170.75 | 177.254 | 0.0096545731562915.30 | -0.0718573347229957.0 | -0.1226352017704850 |
| 31 | 1 | 1d | 2024-03-14 | 172.29 | 173.68 | 171.13 | 172.38 | 72913500 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0109670987038880.00 | 0.0109073961891.93000 | 171.548 | 176.6985 | 0.0101152745914380.0 | -0.0608902360191074.0 | 0.3891275645996190 |
| 32 | 1 | 1d | 2024-03-15 | 170.55 | 172.0 | 169.68 | 172.0 | 121664700 | 0.0 | 0.0 | 2025-01-31 09:40:31 | -0.0022044320686854.8 | -0.0022068654058.001600 | 171.926 | 176.1385 | 0.0099571534245272.6 | -0.0630946680877929.0 | 0.6686169227920760 |
| 33 | 1 | 1d | 2024-03-18 | 174.94 | 177.07 | 172.89 | 173.09 | 75064200 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0063372093023251.00 | 0.0063172136.2485300 | 172.118 | 175.7105 | 0.0088676319762629.70 | -0.0567545878546730.0 | -0.3785855716571860 |
| 34 | 1 | 1d | 2024-03-19 | 173.71 | 175.97 | 172.41 | 175.45 | 55215200 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0136345239141470.0 | 0.0135424115909.16600 | 172.68600000000000 | 175.4375 | 0.0105393458846826.00 | -0.0431229333940526 | -0.2696807849299380 |
| 35 | 1 | 1d | 2024-03-20 | 175.09 | 178.03 | 174.46 | 178.03 | 53423100 | 0.0 | 0.0 | 2025-01-31 09:40:31 | 0.0147050441721288.00 | 0.0145979733875.47200 | 174.19 | 175.256 | 0.0068927229404.41028.0 | -0.0284178892219238.00 | -0.0324566423738391 |