analysis

May 15, 2021

1 Analysis of stock prices in different time periods

NOTE: `base date point` will be set separatly for each period.

Example: if we want to get daily prices within a week then each Monday will be set as `base date point`

[1]:

```
import sys

sys.path.append('..')

from analysis import Column
from common import plot, YahooRange

from loguru import logger
import numpy as np
import pandas as pd
from seaborn import lineplot, barplot, scatterplot, boxplot
from matplotlib import pyplot


FILENAME = "dax/dax_mdax_sdax.csv"
LIMIT = None

logger.remove()
logger.add(sys.stdout, level="INFO")

pass
```

1.1 Monthly stock price fluctuations within a year

[2]:

```
from analysis import get_best_month

df = get_best_month(FILENAME, YahooRange.YEARS_10, limit=LIMIT)
df
```

[2]:

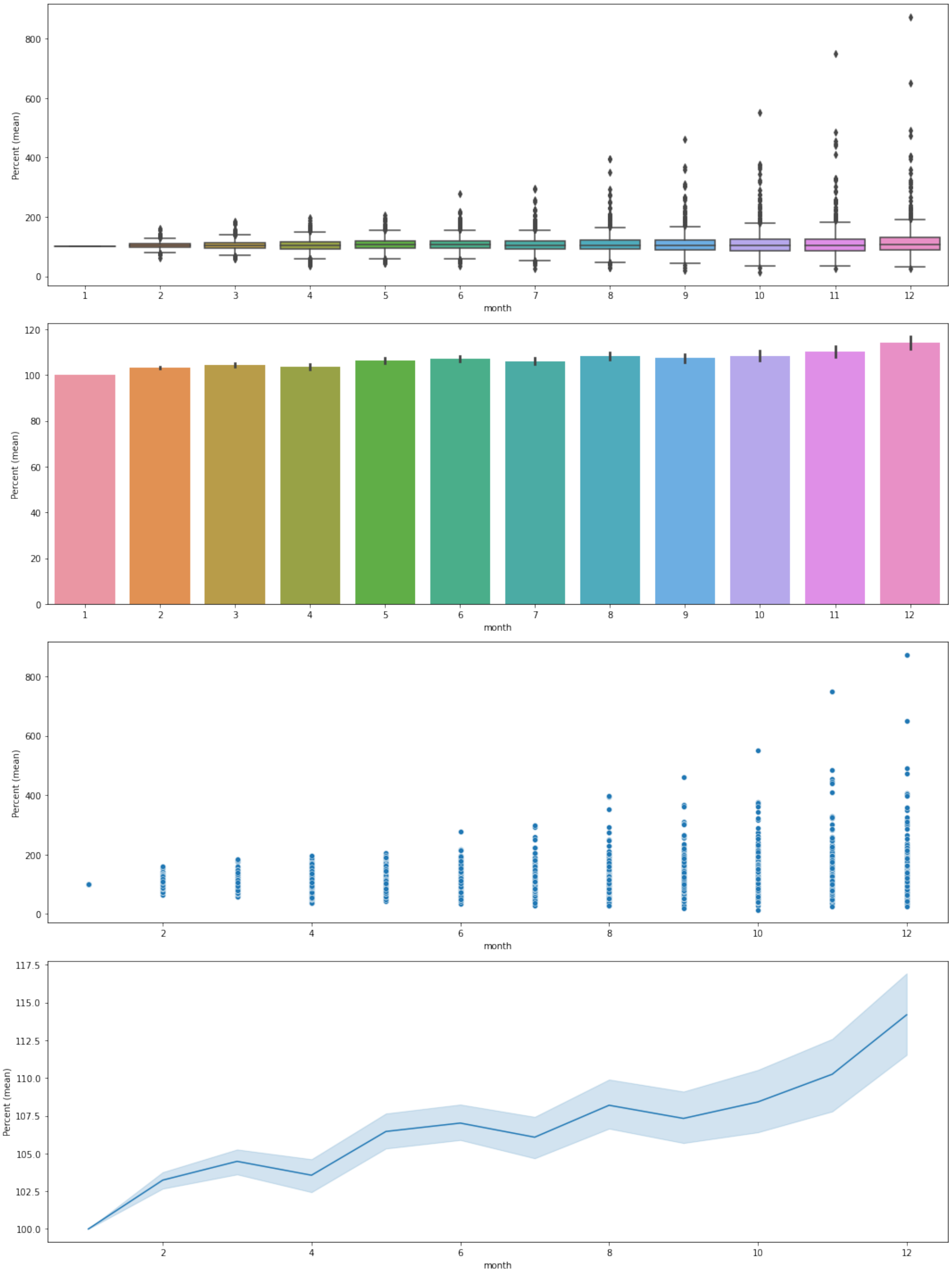
```
       year  month  Symbol  Percent (mean)
0      2011      1  BVB.DE           100.0
```

```
1      2011      2  BVB.DE       114.45313
2      2011      3  BVB.DE      117.578127
3      2011      4  BVB.DE      107.812502
4      2011      5  BVB.DE      121.054689
…     …    …     …             …
15787  2020      8  PAT.DE      116.565956
15788  2020      9  PAT.DE      124.874111
15789  2020     10  PAT.DE      118.328294
15790  2020     11  PAT.DE       98.690835
15791  2020     12  PAT.DE      121.349444

[15792 rows x 4 columns]
```

[3]:

```
plot(x=Column.MONTH, y=Column.PERCENT, data=df)
```

```
       Percent (mean)
month
1               100.0
2          103.235071
3          104.479022
4          103.561544
5          106.458575
```


Percent (mean)
800
600
400
200
0
1
2
3
4
5
6
7
8
9
10
11
12
month
Percent (mean)
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
month
Percent (mean)
800
600
400
200
0
2
4
6
8
10
12
month
Percent (mean)
117.5
115.0
112.5
110.0
107.5
105.0
102.5
100.0
2
4
6
8
10
12
month

1.2 Weekly stock price fluctuations within a year

[4]:

```
from analysis import get_best_week

df = get_best_week(FILENAME, YahooRange.YEARS_10, limit=LIMIT)

df
```

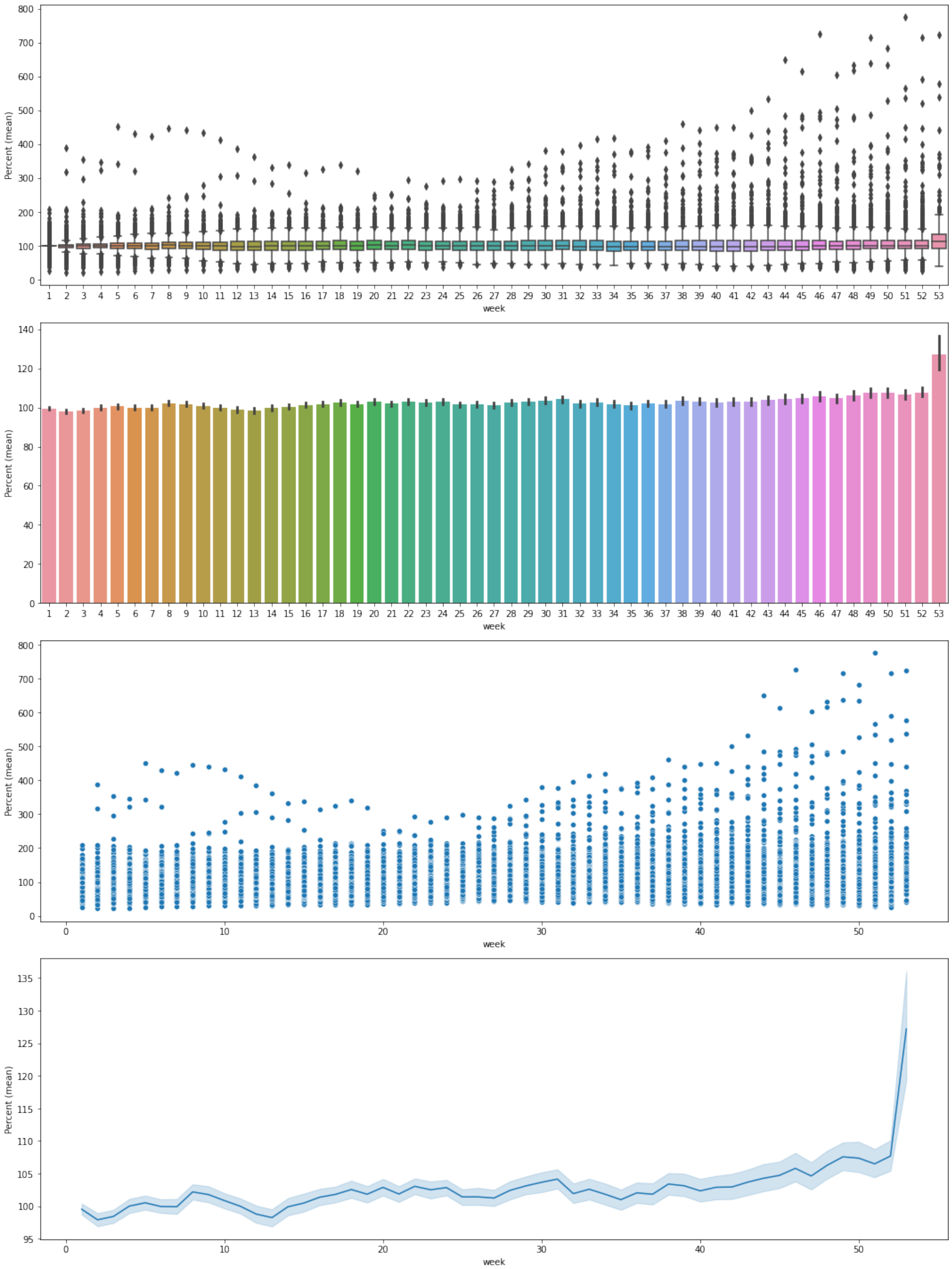
[4]:

```
        year  week  Symbol  Percent (mean)
0       2011     1  AFX.DE           100.0
1       2011     2  AFX.DE       99.441536
2       2011     3  AFX.DE       96.684123
3       2011     4  AFX.DE       97.033157
4       2011     5  AFX.DE       98.568936
…         …    …     …                 …
67898   2020    49  S92.DE      140.763964
67899   2020    50  S92.DE      134.948682
67900   2020    51  S92.DE      145.524506
67901   2020    52  S92.DE      152.651073
67902   2020    53  S92.DE      160.205239

[67903 rows x 4 columns]
```

[5]:

```
plot(x=Column.WEEK, y=Column.PERCENT, data=df)
```

```
      Percent (mean)
week
1          99.541714
2          97.919694
3          98.435284
4         100.015221
5         100.526573
```


Percent (mean)
800
700
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
week
Percent (mean)
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
week
Percent (mean)
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
week
Percent (mean)
135
130
125
120
115
110
105
100
95
0
10
20
30
40
50
week

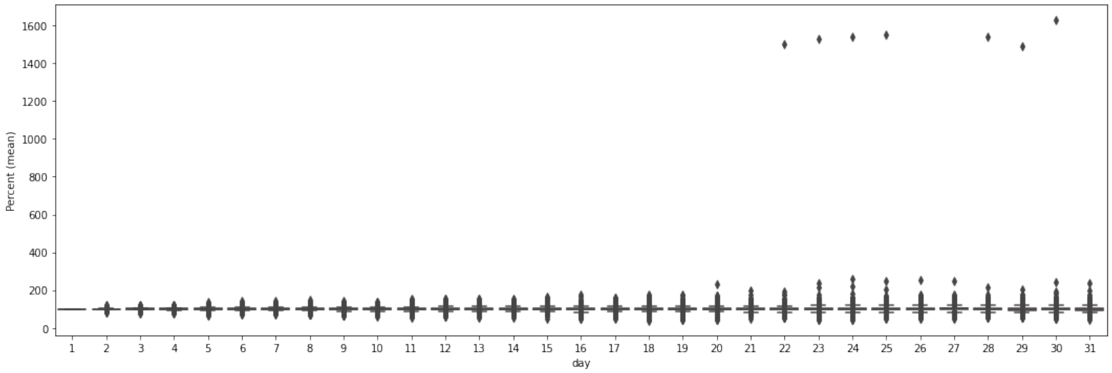
1.3 Daily stock price fluctuations within a month

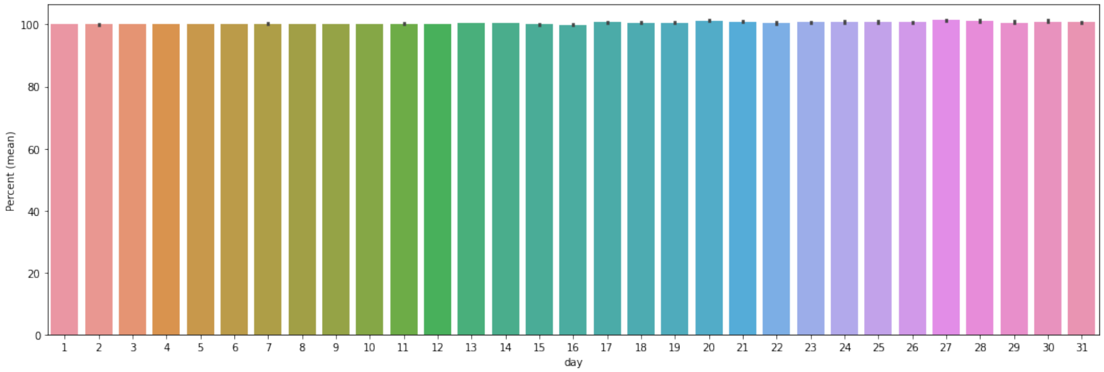
[6]:
```
from analysis import Column,get_best_month_day

df = get_best_month_day(FILENAME, YahooRange.YEARS_10, limit=LIMIT)

df
```

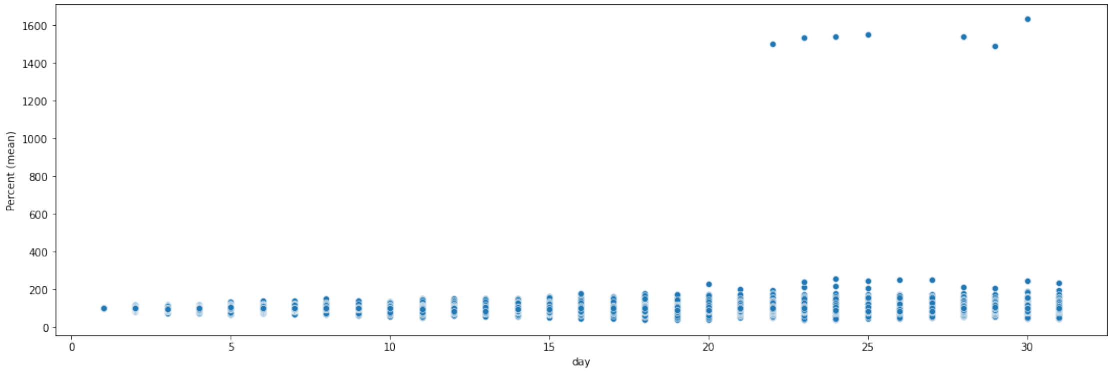
[6]:
```
        year  month  day  Symbol  Percent (mean)
0       2011      1    3  HYQ.DE           100.0
1       2011      1    4  HYQ.DE      100.308546
2       2011      1    5  HYQ.DE      102.989681
3       2011      1    6  HYQ.DE      102.989681
4       2011      1    7  HYQ.DE      108.628576
…       …     …    …    …              …
332648  2020     12   22  SBS.DE      103.436426
332649  2020     12   23  SBS.DE      103.951889
332650  2020     12   28  SBS.DE      104.123707
332651  2020     12   29  SBS.DE      104.467351
332652  2020     12   30  SBS.DE      104.123707

[332653 rows x 5 columns]
```

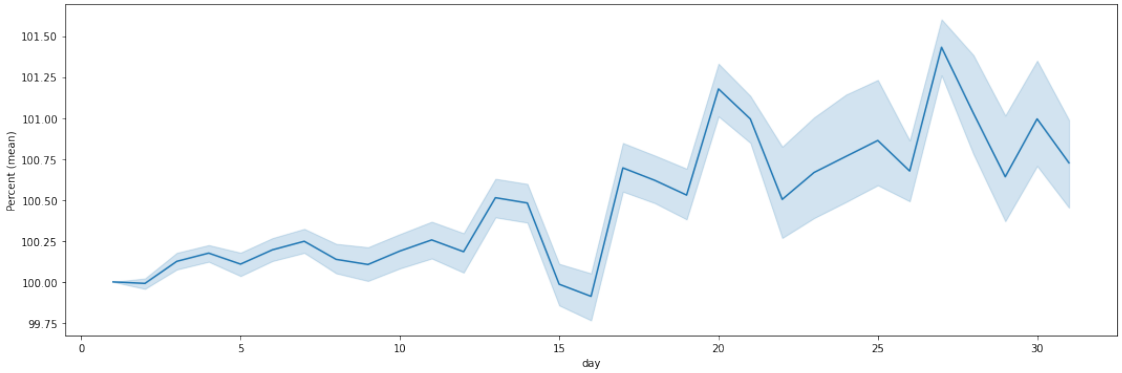
[7]:
```
plot(x=Column.DAY, y=Column.PERCENT, data=df)
```

```
     Percent (mean)
day
1             100.0
2         99.990816
3        100.125494
4        100.175699
5        100.108565
```


Percent (mean)
1600
1400
1200
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
day


Percent (mean)
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
day


Percent (mean)
1600
1400
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30
day


Percent (mean)
101.50
101.25
101.00
100.75
100.50
100.25
100.00
99.75
0
5
10
15
20
25
30
day

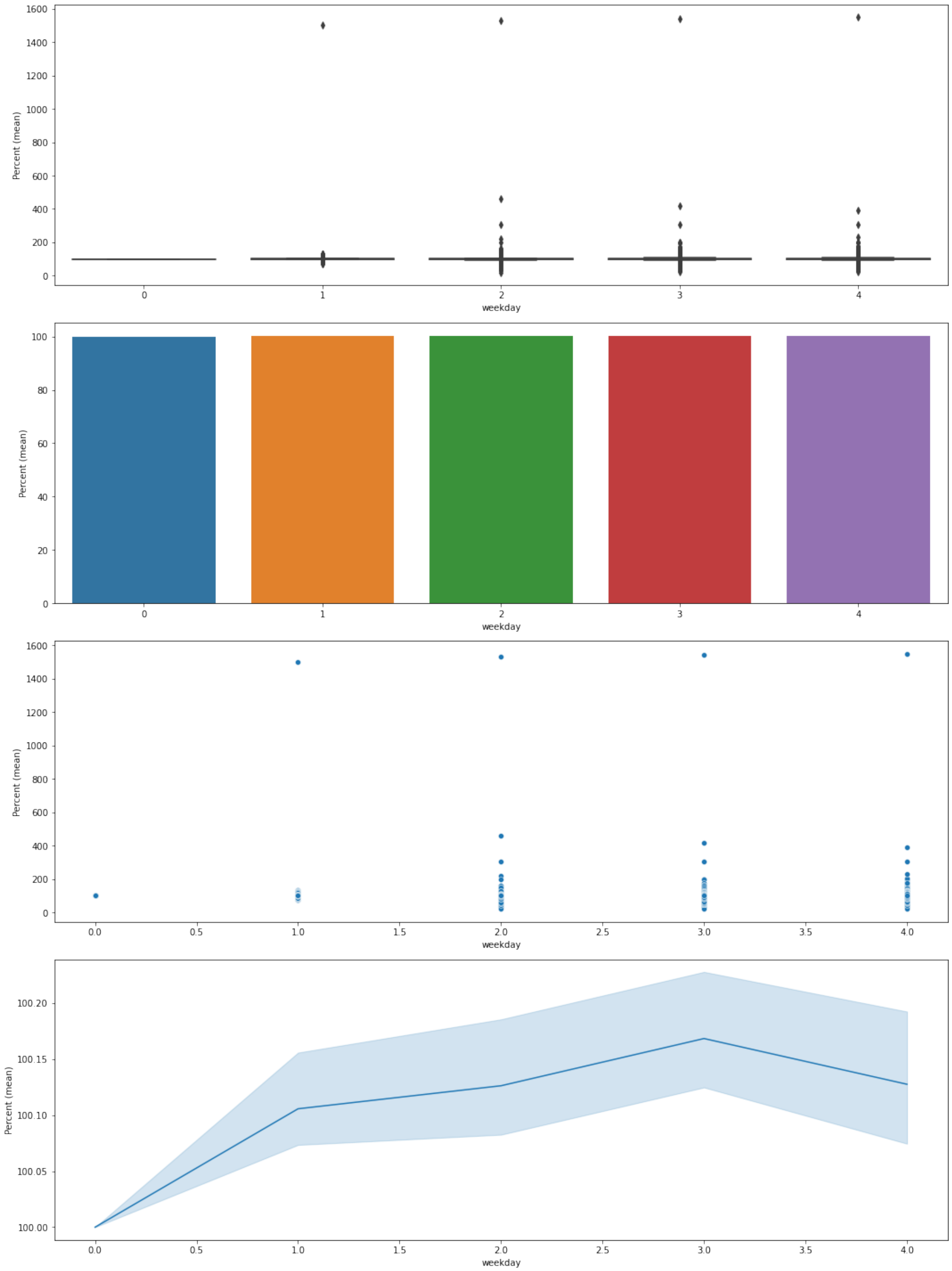
1.4 Daily stock price fluctuations within a week

```
[8]: from analysis import get_best_weekday


     df = get_best_weekday(FILENAME, YahooRange.YEARS_10, limit=LIMIT)

     df
```

```
[8]:         year  week  weekday  Symbol  Percent (mean)
     0       2011     1        0  HYQ.DE           100.0
     1       2011     1        1  HYQ.DE      100.308546
     2       2011     1        2  HYQ.DE      102.989681
     3       2011     1        3  HYQ.DE      102.989681
     4       2011     1        4  HYQ.DE      108.628576
     …         …    …      …        …              …
     335762  2020    52        1  SBS.DE      102.555366
     335763  2020    52        2  SBS.DE      103.066438
     335764  2020    53        0  SBS.DE           100.0
     335765  2020    53        1  SBS.DE      100.330034
     335766  2020    53        2  SBS.DE           100.0

     [335767 rows x 5 columns]
```

```
[9]: plot(x=Column.WEEKDAY, y=Column.PERCENT, data=df)
```

```
         Percent (mean)
weekday
0                 100.0
1            100.105653
2            100.126205
3             100.16834
4            100.127546
```


Percent (mean)
1600
1400
1200
1000
800
600
400
200
0
0
1
2
3
4
weekday
Percent (mean)
100
80
60
40
20
0
0
1
2
3
4
weekday
Percent (mean)
1600
1400
1200
1000
800
600
400
200
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
weekday
Percent (mean)
100.20
100.15
100.10
100.05
100.00
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
weekday

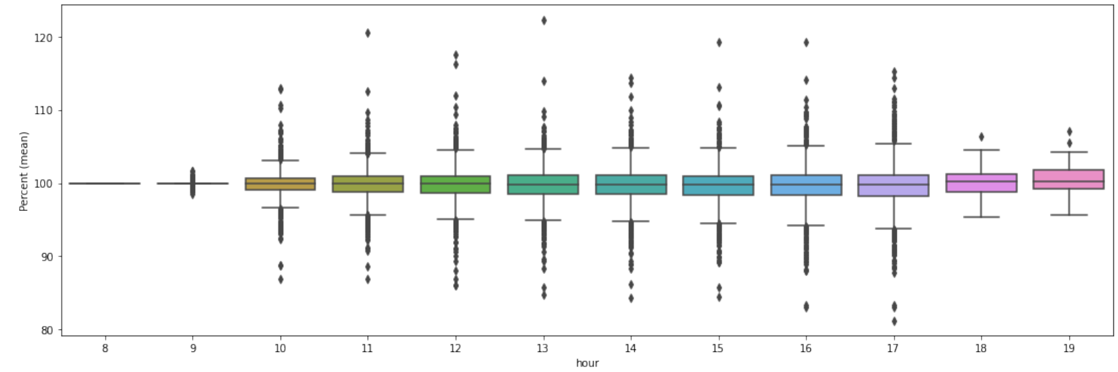
1.5 Hourly stock price fluctuations with a day

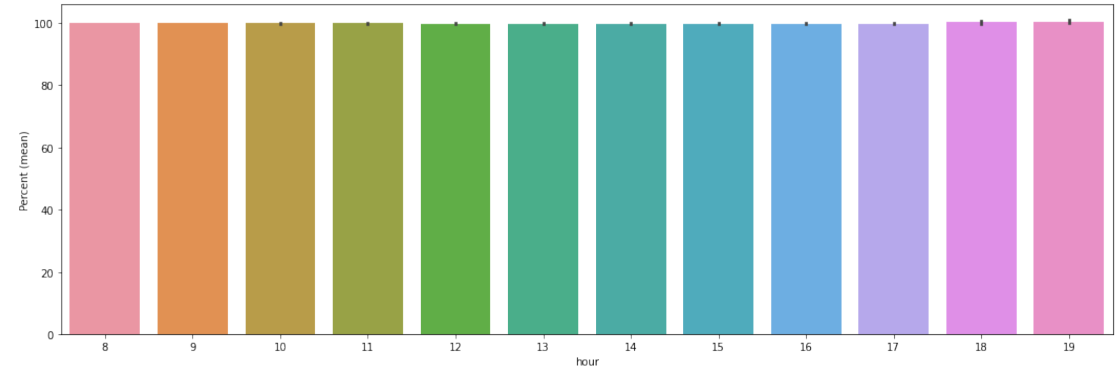
```
[10]: from analysis import get_best_hour

      df = get_best_hour(FILENAME, YahooRange.YEARS_2, limit=LIMIT)

      df
```

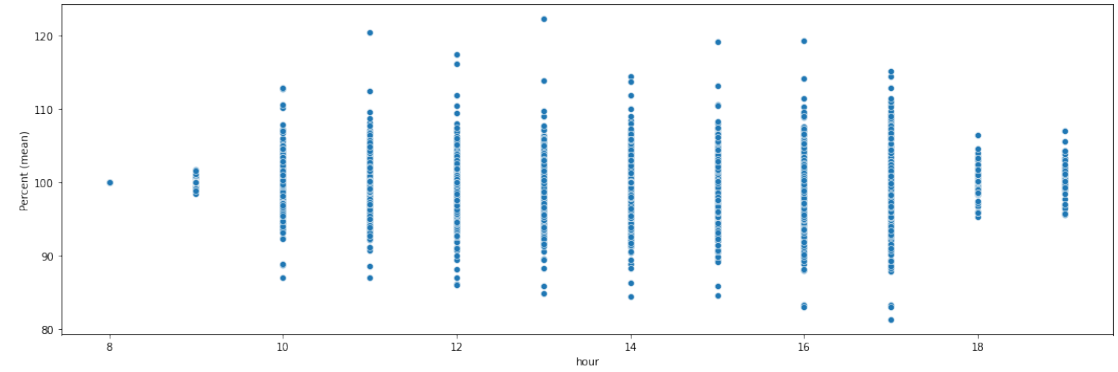
```
[10]:        year  week  day  hour   Symbol  Percent (mean)
      0      2020    40   28     9    ENR.F           100.0
      1      2020    40   28    10    ENR.F       95.592915
      2      2020    40   28    11    ENR.F      102.998636
      3      2020    40   28    12    ENR.F      102.998636
      4      2020    40   28    13    ENR.F       99.045884
      …     …    …   …   …      …             …
      9700   2020    53   28    13  8TRA.DE      100.306814
      9701   2020    53   28    14  8TRA.DE      100.043832
      9702   2020    53   28    15  8TRA.DE      100.131487
      9703   2020    53   28    16  8TRA.DE      100.284894
      9704   2020    53   28    17  8TRA.DE       99.846593

      [9705 rows x 6 columns]
```

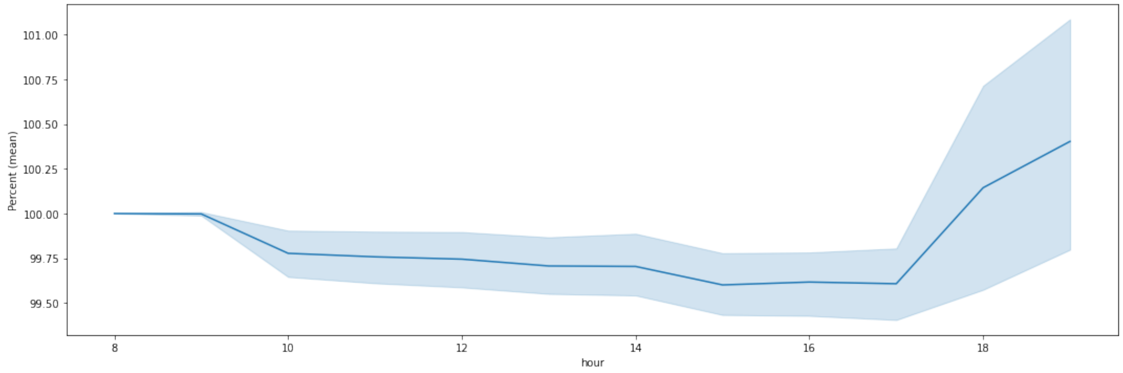
```
[11]: plot(x=Column.HOUR, y=Column.PERCENT, data=df)
```

```
      Percent (mean)
hour
8              100.0
9          99.997603
10         99.777622
11         99.757996
12         99.744947
```


Percent (mean)
120
110
100
90
80
8
9
10
11
12
13
14
15
16
17
18
19
hour


Percent (mean)
100
80
60
40
20
0
8
9
10
11
12
13
14
15
16
17
18
19
hour


Percent (mean)
120
110
100
90
80
8
10
12
14
16
18
hour


Percent (mean)
101.00
100.75
100.50
100.25
100.00
99.75
99.50
8
10
12
14
16
18
hour

1.6 Hourly and quarterly stock price fluctuations within a day

[2]:

```
from analysis import get_best_time

df = get_best_time(FILENAME, YahooRange.DAYS_58, limit=LIMIT)

df
```

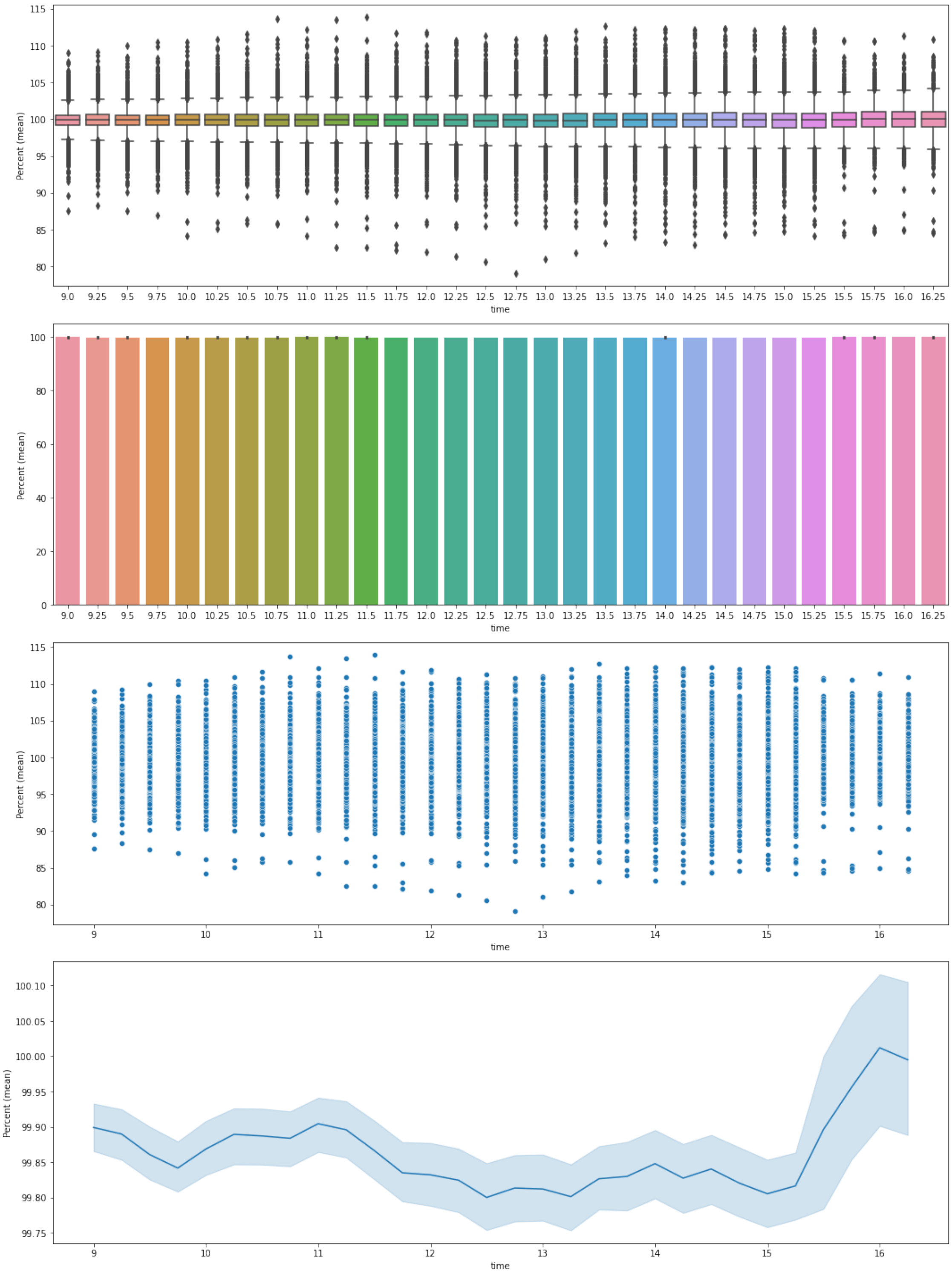
[2]:

```
        year  week  day  hour  minute   time  Symbol  Percent (mean)
0       2021    11   17     8       0    8.0  SZU.DE           100.0
1       2021    11   17     8      15   8.25  SZU.DE       99.782295
2       2021    11   17     8      30    8.5  SZU.DE       99.782295
3       2021    11   17     8      45   8.75  SZU.DE       99.854866
4       2021    11   17     9       0    9.0  SZU.DE       99.637154
…        …     …    …    …      …      …          …
207268  2021    19   11    14      15  14.25  PBB.DE       96.702191
207269  2021    19   11    14      30   14.5  PBB.DE       96.480994
207270  2021    19   11    14      45  14.75  PBB.DE       96.420672
207271  2021    19   11    15       0   15.0  PBB.DE       96.682084
207272  2021    19   11    15      15  15.25  PBB.DE       96.420672

[207273 rows x 8 columns]
```

[12]:

```
# NOTE: filter extreme points, plot df first and if charts are bad try with fdf
fdf = df[df[Column.TIME].isin(np.arange(9, 16.5, 0.25))].copy()

plot(x=Column.TIME, y=Column.PERCENT, data=fdf)
```

```
       Percent (mean)
time
9.00         99.89904
9.25        99.889765
9.50        99.860612
9.75        99.841535
10.00       99.868492
```


Percent (mean)
115
110
105
100
95
90
85
80
9.0
9.25
9.5
9.75
10.0
10.25
10.5
10.75
11.0
11.25
11.5
11.75
12.0
12.25
12.5
12.75
13.0
13.25
13.5
13.75
14.0
14.25
14.5
14.75
15.0
15.25
15.5
15.75
16.0
16.25
time
Percent (mean)
100
80
60
40
20
0
9.0
9.25
9.5
9.75
10.0
10.25
10.5
10.75
11.0
11.25
11.5
11.75
12.0
12.25
12.5
12.75
13.0
13.25
13.5
13.75
14.0
14.25
14.5
14.75
15.0
15.25
15.5
15.75
16.0
16.25
time
Percent (mean)
115
110
105
100
95
90
85
80
9
10
11
12
13
14
15
16
time
Percent (mean)
100.10
100.05
100.00
99.95
99.90
99.85
99.80
99.75
9
10
11
12
13
14
15
16
time

1.7 Quarterly stock price fluctuations within an hour

[14]:

```
from analysis import get_best_quarter

df = get_best_quarter(FILENAME, YahooRange.DAYS_58, limit=LIMIT)

df
```

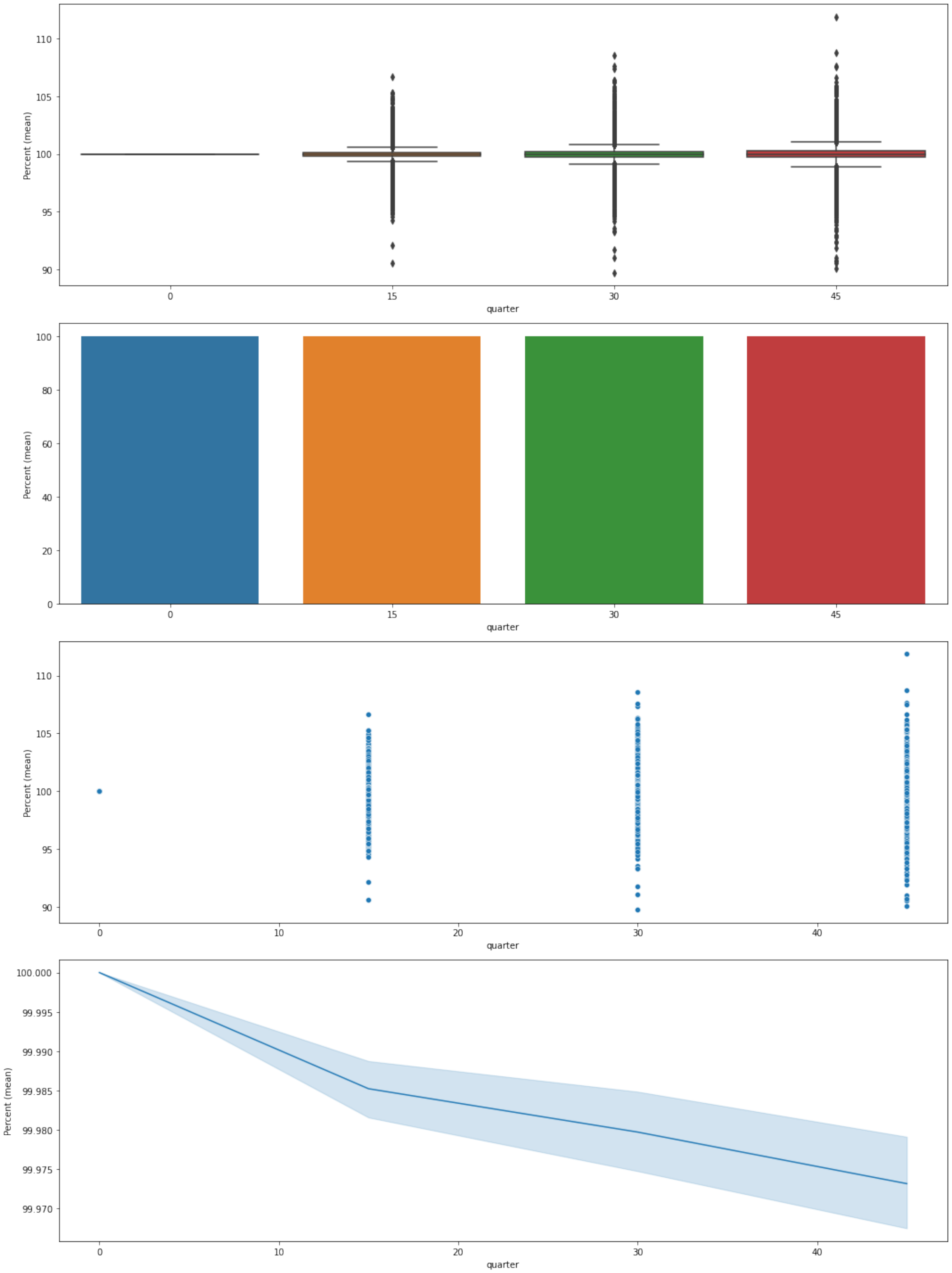
[14]:

```
        year  week  day  hour  minute  quarter  Symbol  Percent (mean)
0       2021    11   17     8       0        0  SZU.DE           100.0
1       2021    11   17     8      15       15  SZU.DE       99.782295
2       2021    11   17     8      30       30  SZU.DE       99.782295
3       2021    11   17     8      45       45  SZU.DE       99.854866
4       2021    11   17     9       0        0  SZU.DE           100.0
…          …     …    …     …       …        …       …
206307  2021    19   11    15      15       15  PBB.DE       99.729617
206308  2021    19   11     7       0        0  PBB.DE           100.0
206309  2021    19   11     7      15       15  PBB.DE       98.451636
206310  2021    19   11     7      30       30  PBB.DE       98.230448
206311  2021    19   11     7      45       45  PBB.DE       98.049465

[206312 rows x 8 columns]
```

[15]:

```
plot(x=Column.QUARTER, y=Column.PERCENT, data=df)
```

```
         Percent (mean)
quarter
0                 100.0
15            99.985235
30            99.979725
45            99.973171
```

Percent (mean)
110
105
100
95
90
0
15
30
45
quarter
Percent (mean)
100
80
60
40
20
0
0
15
30
45
quarter
Percent (mean)
110
105
100
95
90
0
10
20
30
40
quarter
Percent (mean)
100.000
99.995
99.990
99.985
99.980
99.975
99.970
0
10
20
30
40
quarter

```
[ ]:
```