analysis

May 17, 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 = "sp500/sp500.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_20, limit=LIMIT)
df
```

[2]:

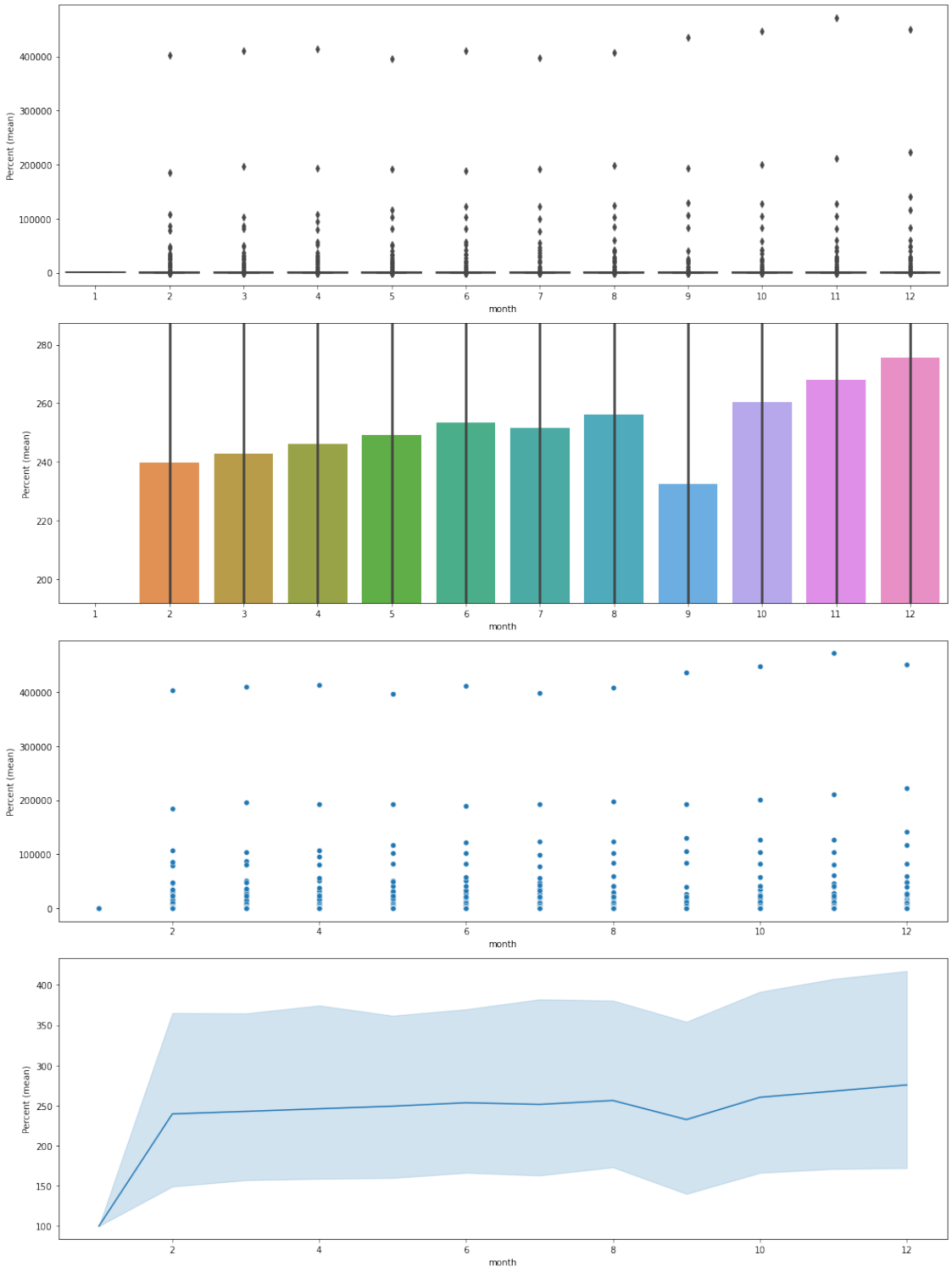
	year	month	Symbol	Percent (mean)
0	2001	1	SWKS	100.0
1	2001	2	SWKS	81.063123

```
2       2001      3   SWKS       39.202658
3       2001      4   SWKS       40.863787
4       2001      5   SWKS       65.887046
…       …     …     …              …
107563  2020      8   CTVA       96.544788
107564  2020      9   CTVA       95.873869
107565  2020     10   CTVA        96.88024
107566  2020     11   CTVA      111.640387
107567  2020     12   CTVA      129.822212

[107568 rows x 4 columns]
```

[3]:
```
plot(x=Column.MONTH, y=Column.PERCENT, data=df)
```

```
       Percent (mean)
month
1               100.0
2           239.64699
3           242.718224
4           246.055416
5           249.246913
```


Percent (mean)
month
Percent (mean)
month
Percent (mean)
month
Percent (mean)
month

1.2 Weekly stock price fluctuations within a year

[4]:
```
from analysis import get_best_week

df = get_best_week(FILENAME, YahooRange.YEARS_20, limit=LIMIT)

df
```

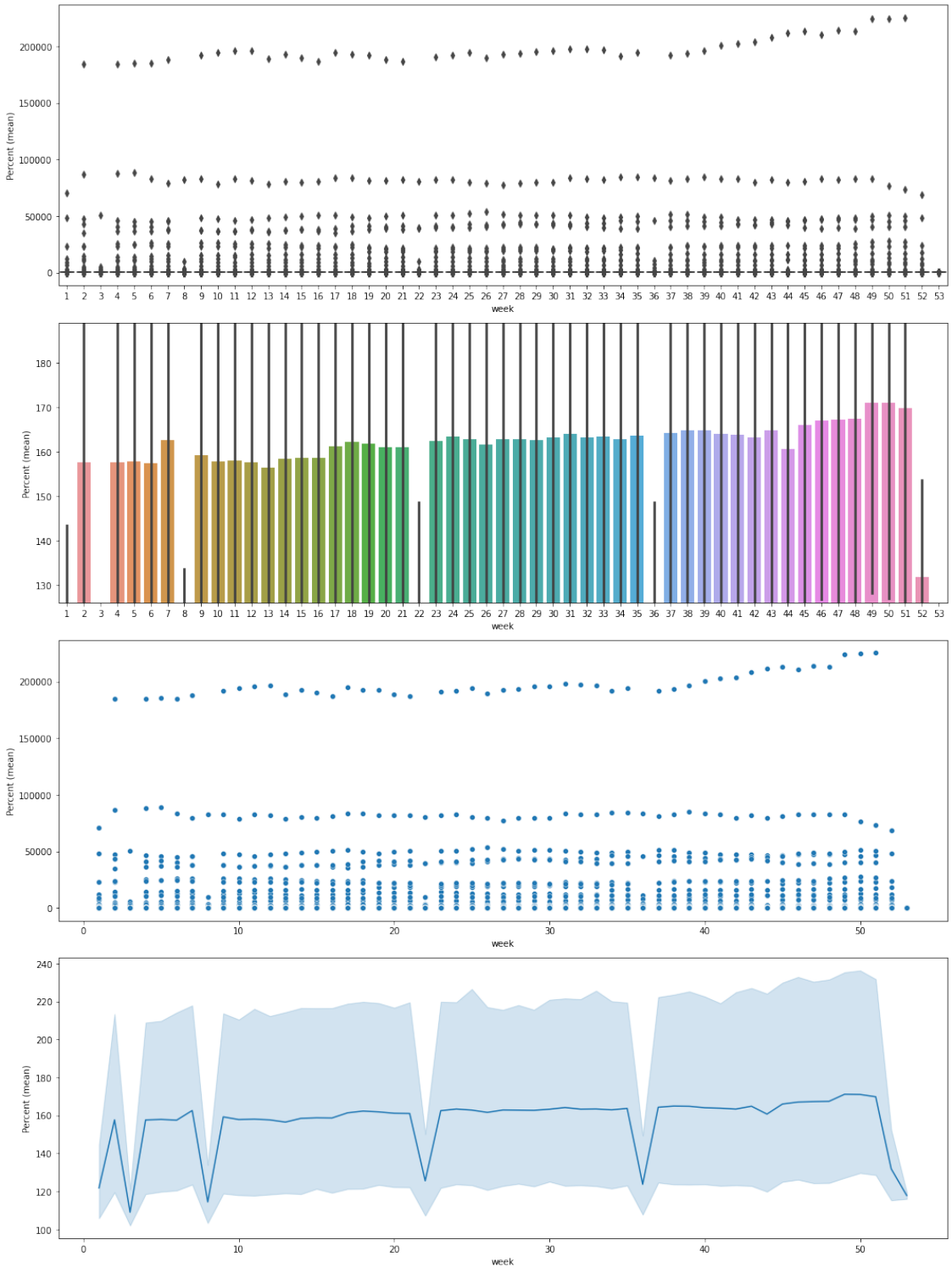
[4]:

	year	week	Symbol	Percent (mean)
0	2001	1	TXT	100.0
1	2001	2	TXT	101.851852
2	2001	3	TXT	102.910053
3	2001	4	TXT	101.587302
4	2001	5	TXT	102.222221
…	…	…	…	…
466839	2020	49	KSU	123.68814
466840	2020	50	KSU	125.549718
466841	2020	51	KSU	128.241557
466842	2020	52	KSU	126.347536
466843	2020	53	KSU	130.959328

[466844 rows x 4 columns]

[5]:
```
plot(x=Column.WEEK, y=Column.PERCENT, data=df)
```

week	Percent (mean)
1	121.795913
2	157.642551
3	108.984987
4	157.598862
5	157.87288


Percent (mean)
week
Percent (mean)
week
Percent (mean)
week
Percent (mean)
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_20, limit=LIMIT)

df
```

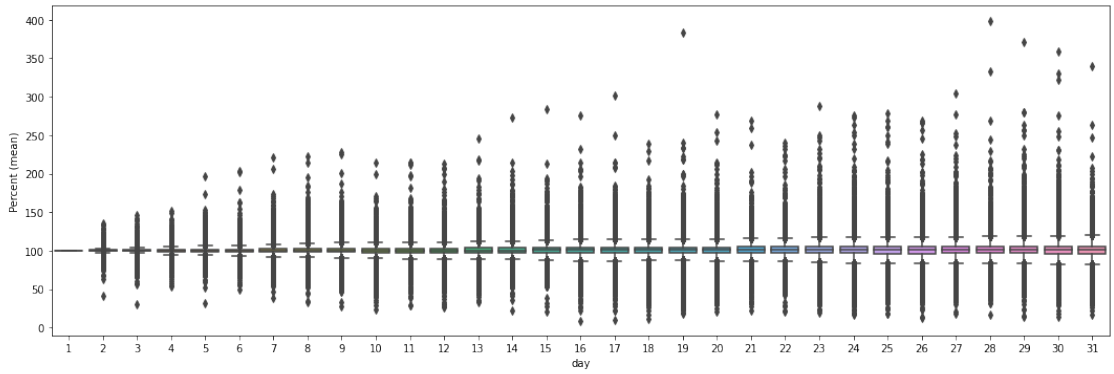
[6]:

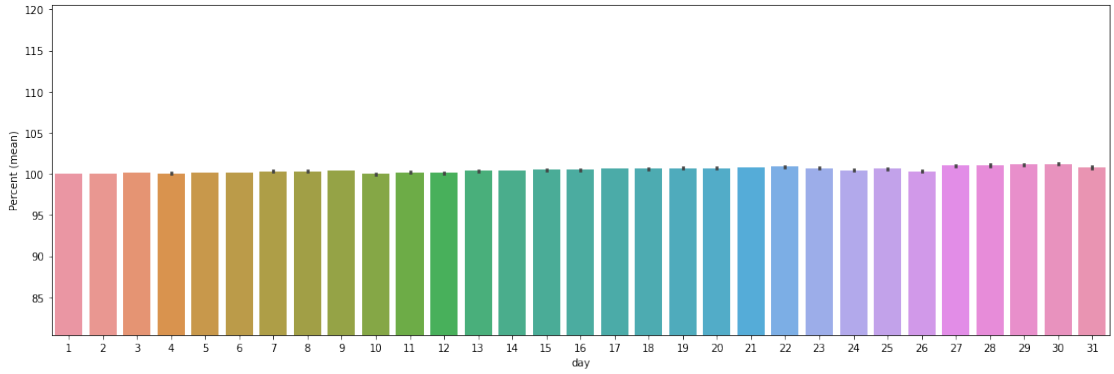
	year	month	day	Symbol	Percent (mean)
0	2001	8	1	ZBH	100.0
1	2001	8	2	ZBH	101.655171
2	2001	8	3	ZBH	97.931033
3	2001	8	6	ZBH	96.551724
4	2001	8	7	ZBH	98.275862
…	…	…	…	…	…
2257405	2020	12	24	TSCO	104.380545
2257406	2020	12	28	TSCO	105.026614
2257407	2020	12	29	TSCO	102.222215
2257408	2020	12	30	TSCO	101.817535
2257409	2020	12	31	TSCO	101.682638

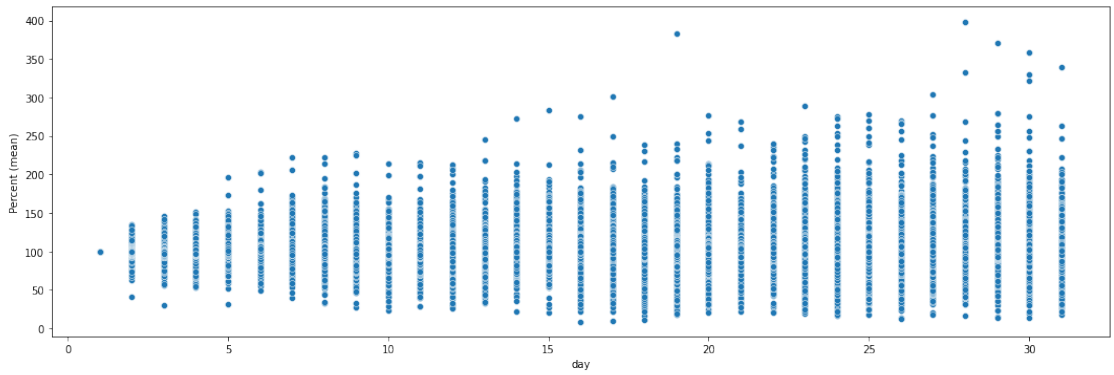
[2257410 rows x 5 columns]

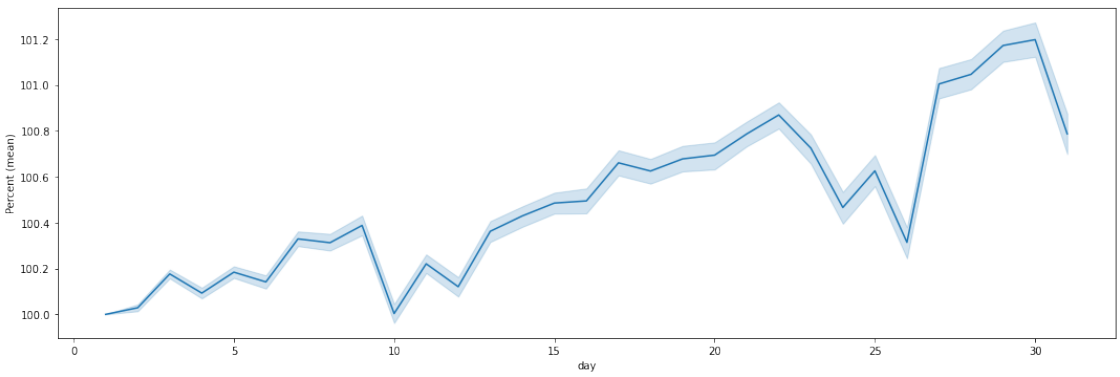
[7]:
```
plot(x=Column.DAY, y=Column.PERCENT, data=df)
```

day	Percent (mean)
1	100.0
2	100.028702
3	100.17617
4	100.092589
5	100.183848


Percent (mean)
day


Percent (mean)
day


Percent (mean)
day


Percent (mean)
day

1.4 Daily stock price fluctuations within a week

[8]:
```
from analysis import get_best_weekday


df = get_best_weekday(FILENAME, YahooRange.YEARS_20, limit=LIMIT)

df
```

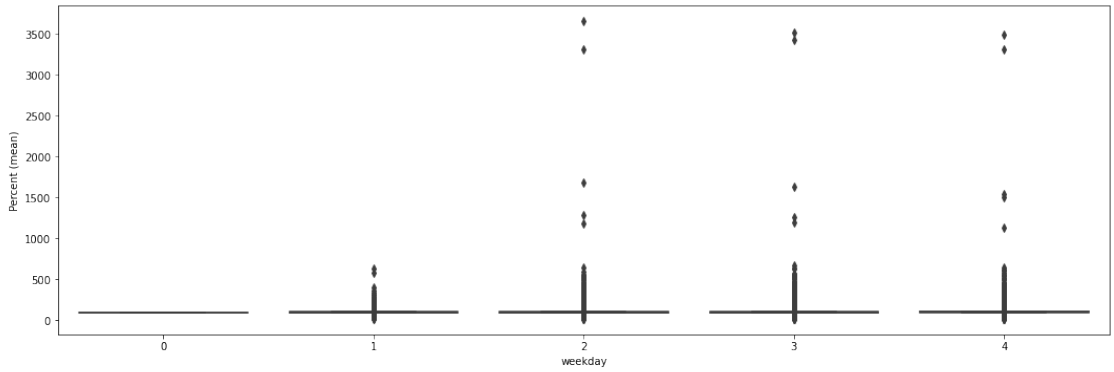
[8]:

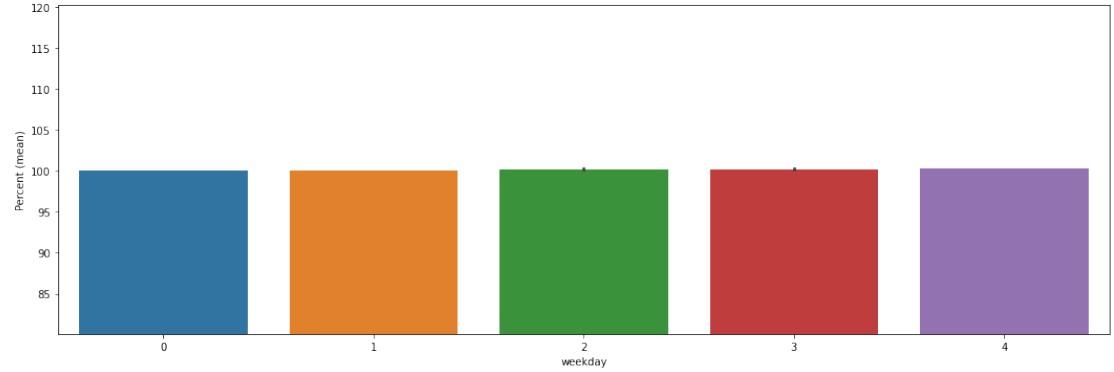
	year	week	weekday	Symbol	Percent (mean)
0	2001	30	2	ZBH	100.0
1	2001	30	3	ZBH	97.9661
2	2001	30	4	ZBH	95.593223
3	2001	31	0	ZBH	100.0
4	2001	31	1	ZBH	100.211266
…	…	…	…	…	…
2261315	2020	52	3	TSCO	101.218592
2261316	2020	53	0	TSCO	100.0
2261317	2020	53	1	TSCO	97.32982
2261318	2020	53	2	TSCO	96.944508
2261319	2020	53	3	TSCO	96.816067

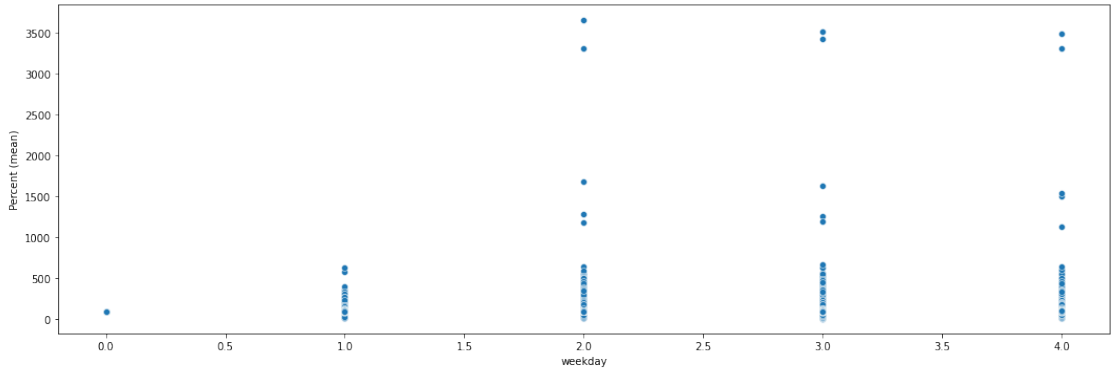
[2261320 rows x 5 columns]

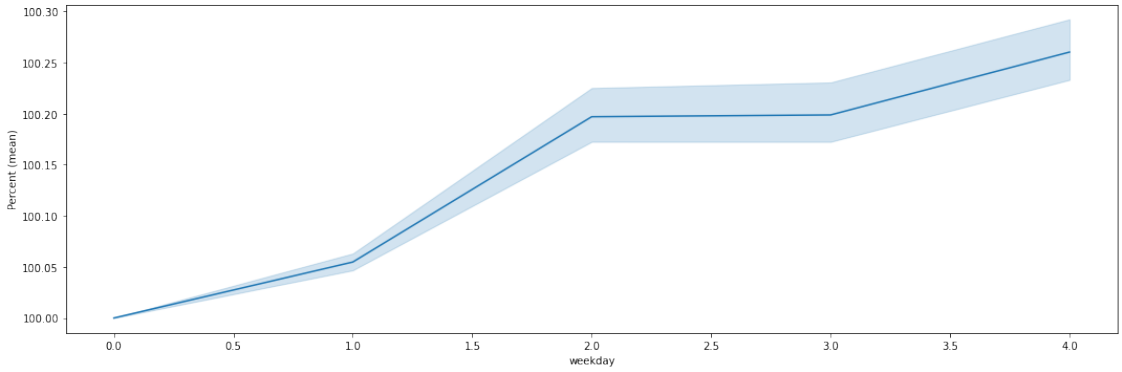
[9]:
```
plot(x=Column.WEEKDAY, y=Column.PERCENT, data=df)
```

weekday	Percent (mean)
0	100.0
1	100.054767
2	100.196967
3	100.198714
4	100.260233


Percent (mean)
weekday


Percent (mean)
weekday


Percent (mean)
weekday


Percent (mean)
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
```

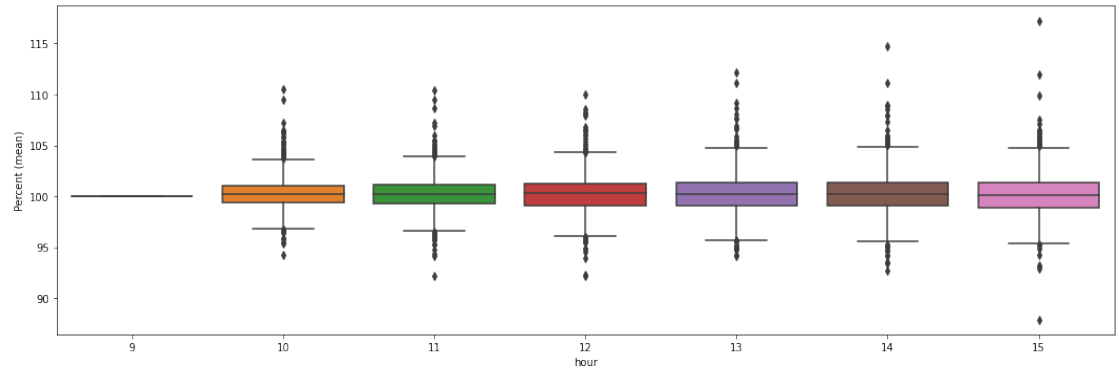
[10]:

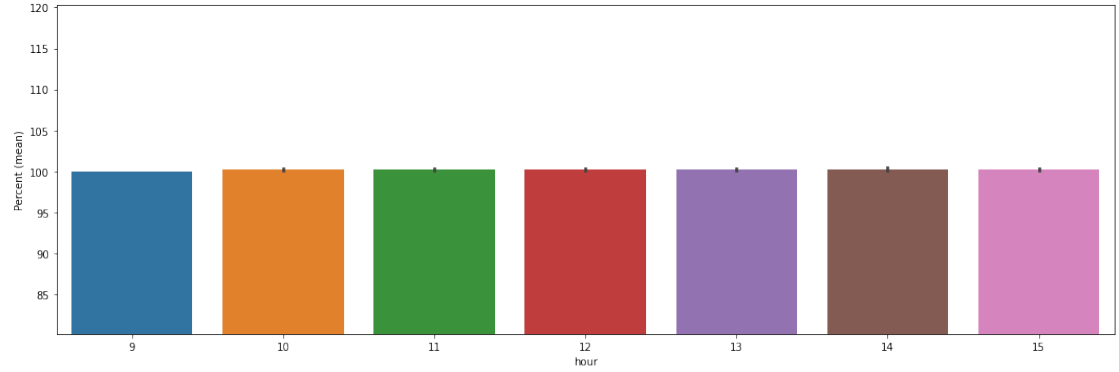
	year	week	day	hour	Symbol	Percent (mean)
0	2020	14	3	9	OTIS	100.0
1	2020	14	3	10	OTIS	99.065634
2	2020	14	3	11	OTIS	104.238834
3	2020	14	3	12	OTIS	106.494983
4	2020	14	3	13	OTIS	111.109845
…	…	…	…	…	…	…
5377	2020	53	31	11	CTVA	99.974138
5378	2020	53	31	12	CTVA	100.36213
5379	2020	53	31	13	CTVA	100.336268
5380	2020	53	31	14	CTVA	100.569067
5381	2020	53	31	15	CTVA	100.49146

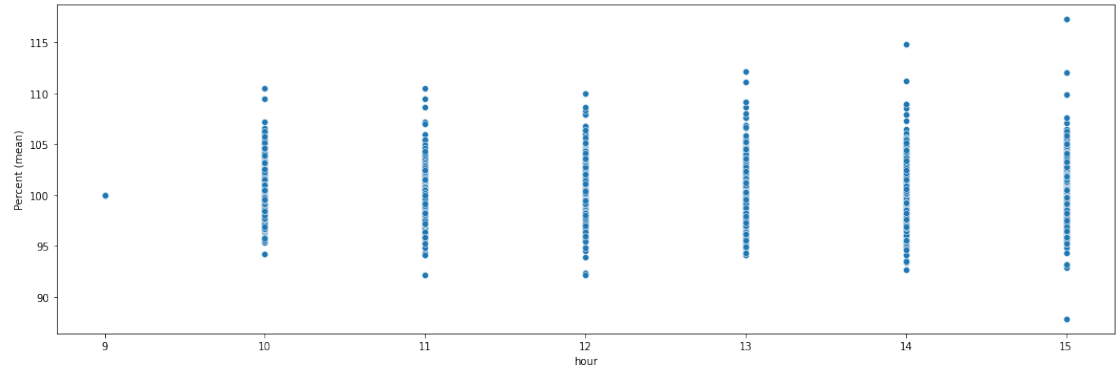
[5382 rows x 6 columns]

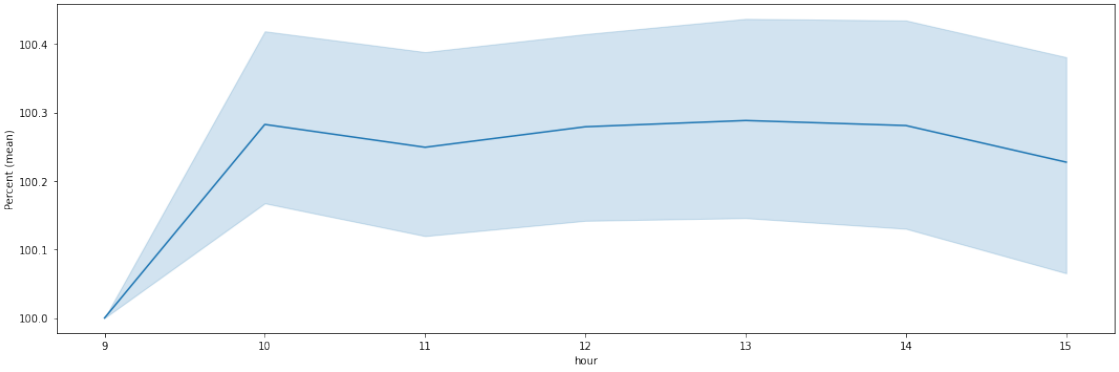
[11]:
```
plot(x=Column.HOUR, y=Column.PERCENT, data=df)
```

hour	Percent (mean)
9	100.0
10	100.282448
11	100.249114
12	100.27905
13	100.288189


Percent (mean)
hour


Percent (mean)
hour


Percent (mean)
hour


Percent (mean)
hour

1.6 Hourly and quarterly stock price fluctuations within a day

[12]:
```
from analysis import get_best_time

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

df
```

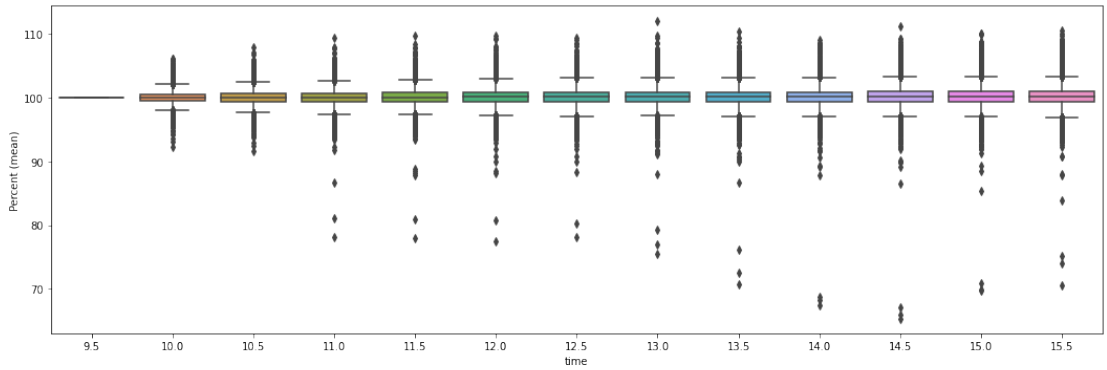
[12]:

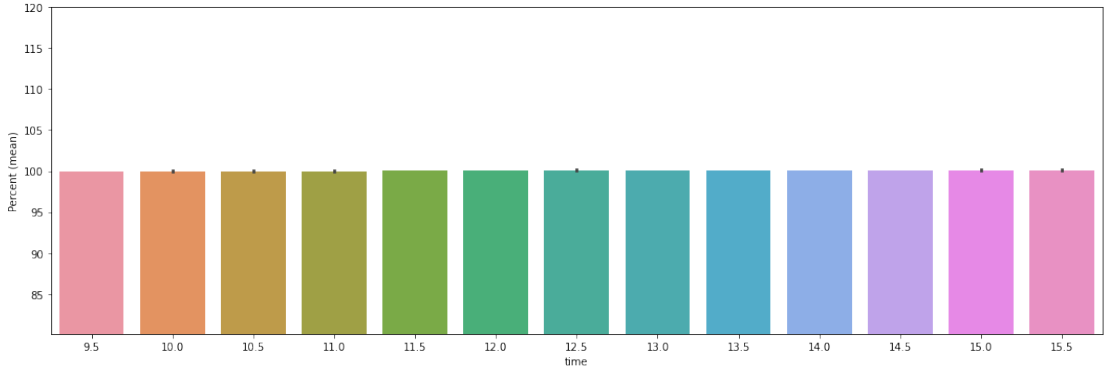
	year	week	day	hour	minute	time	Symbol	Percent (mean)
0	2021	11	18	9	30	9.5	TXT	100.0
1	2021	11	18	10	0	10.0	TXT	100.866425
2	2021	11	18	10	30	10.5	TXT	102.518044
3	2021	11	18	11	0	11.0	TXT	102.400718
4	2021	11	18	11	30	11.5	TXT	102.238263
…	…	…	…	…	…	…	…	…
236800	2021	19	11	13	30	13.5	UDR	99.632516
236801	2021	19	11	14	0	14.0	UDR	99.697364
236802	2021	19	11	14	30	14.5	UDR	99.265023
236803	2021	19	11	15	0	15.0	UDR	99.048857
236804	2021	19	11	15	30	15.5	UDR	99.200175

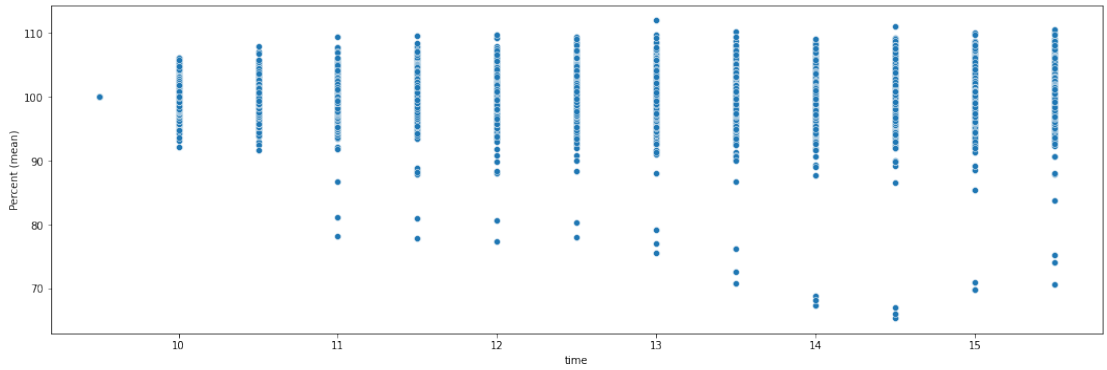
[236805 rows x 8 columns]

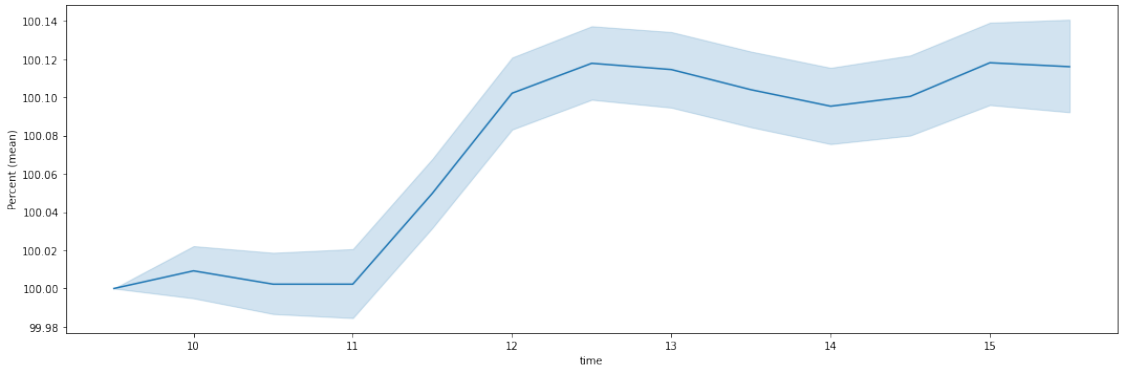
[13]:
```
plot(x=Column.TIME, y=Column.PERCENT, data=df)
```

time	Percent (mean)
9.5	100.0
10.0	100.009234
10.5	100.002248
11.0	100.00225
11.5	100.049851


Percent (mean)
time
9.5
10.0
10.5
11.0
11.5
12.0
12.5
13.0
13.5
14.0
14.5
15.0
15.5


Percent (mean)
time


Percent (mean)
time


Percent (mean)
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
```

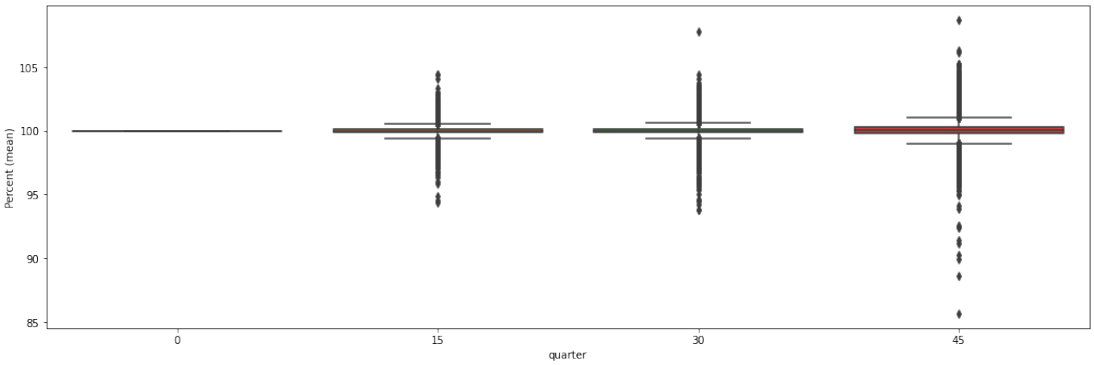
[14]:

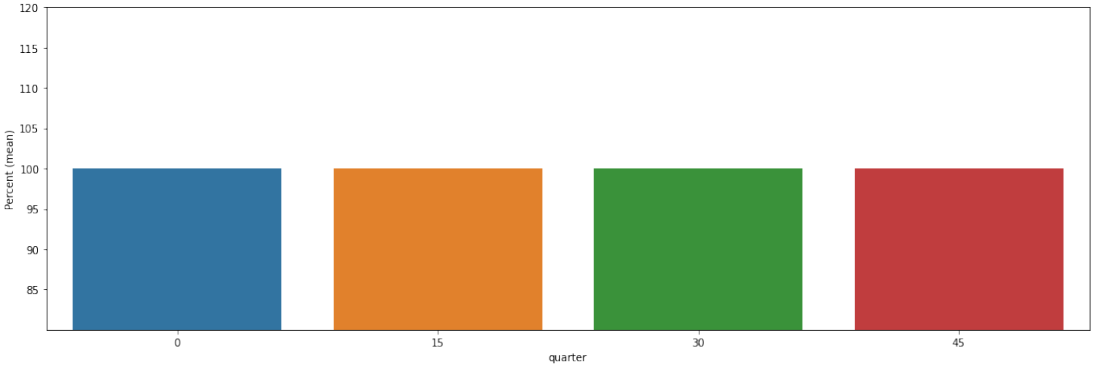
	year	week	day	hour	minute	quarter	Symbol	Percent (mean)
0	2021	11	18	9	30	30	AME	100.0
1	2021	11	18	9	45	45	AME	100.621704
2	2021	11	18	10	0	0	AME	100.0
3	2021	11	18	10	15	15	AME	100.061385
4	2021	11	18	10	30	30	AME	99.897688
…	…	…	…	…	…	…	…	…
470959	2021	19	11	14	45	45	LVS	99.752651
470960	2021	19	11	15	0	0	LVS	100.0
470961	2021	19	11	15	15	15	LVS	99.734423
470962	2021	19	11	15	30	30	LVS	99.964588
470963	2021	19	11	15	45	45	LVS	99.575075

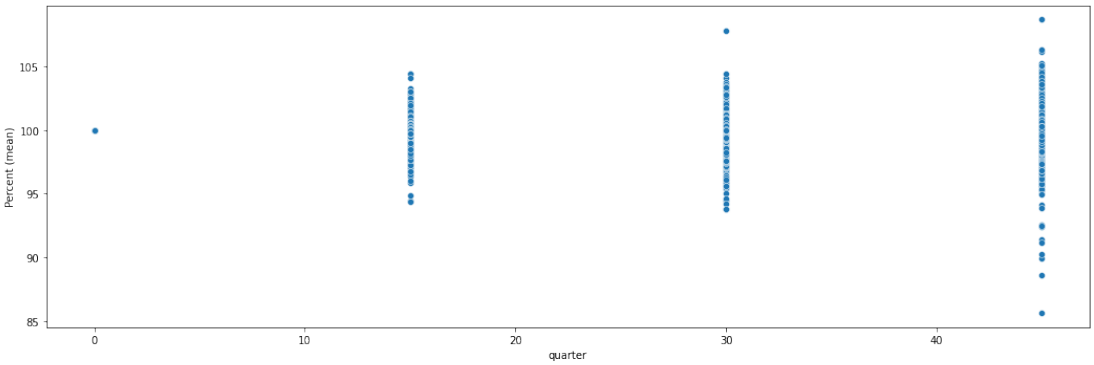
[470964 rows x 8 columns]

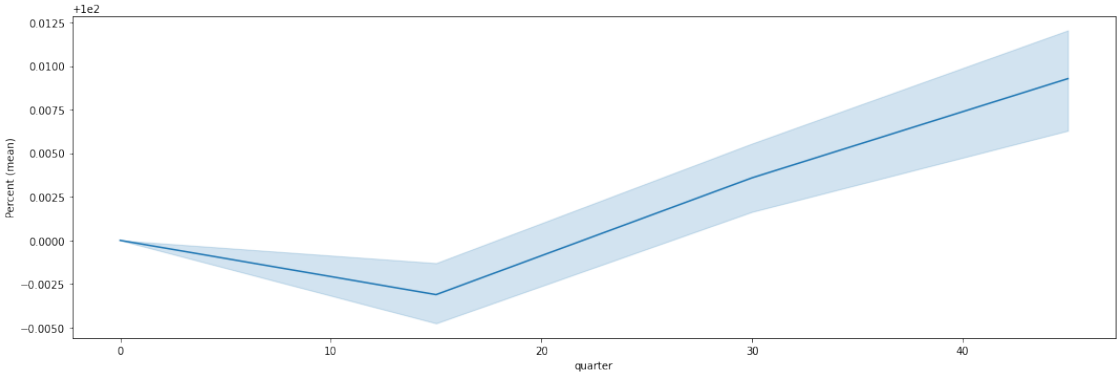
[15]:
```
plot(x=Column.QUARTER, y=Column.PERCENT, data=df)
```

quarter	Percent (mean)
0	100.0
15	99.996887
30	100.003585
45	100.009275


Percent (mean)
105
100
95
90
85
0
15
30
45
quarter


Percent (mean)
120
115
110
105
100
95
90
85
0
15
30
45
quarter


Percent (mean)
105
100
95
90
85
0
10
20
30
40
quarter


+1e2
Percent (mean)
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−0.0025
−0.0050
0
10
20
30
40
quarter

[ ]: