In [111…
```
import pandas as pd                    # dataframe library
import matplotlib.pyplot as plt        # plot data
import numpy as np                     # N-dim object support
import seaborn as sns
import calendar

# do ploting inline
%matplotlib inline
```

In [112…
```
df = pd.read_csv('BTCUSDT.csv',names=['Date','Time','Open','High','Low','Close','Vol
```

In [113…
```
df.head(3)
```

Out[113…

	Date	Time	Open	High	Low	Close	Volume	TickVolume	Spread
0	2017.08.17	04:00:00	4261.48	4261.48	4261.48	4261.48	100	100	1
1	2017.08.17	04:01:00	4261.48	4261.48	4261.48	4261.48	1	1	1
2	2017.08.17	04:02:00	4280.56	4280.56	4280.56	4280.56	38	38	1

In [114…
```
df['DateTime'] = pd.to_datetime(df['Date'] + ' ' + df['Time'])
df = df[['Date', 'Time', 'DateTime', 'Open', 'High', 'Low', 'Close', 'Volume', 'Tick
df['Open'] = df['Open'].astype(float)
df['High'] = df['High'].astype(float)
df['Low'] = df['Low'].astype(float)
df['Close'] = df['Close'].astype(float)
df['Volume'] = df['Volume'].astype(int)
df['TickVolume'] = df['TickVolume'].astype(int)
df['Spread'] = df['Spread'].astype(int)
```

In [115…
```
#Remove 2017 because it has only 2 months.
df = df[(df['DateTime']>pd.Timestamp(2018,1,1))]
df.head(3)
```

Out[115…

	Date	Time	DateTime	Open	High	Low	Close	Volume	TickVolume
196741	2018.01.01	00:01:00	2018-01-01 00:01:00	13707.91	13707.91	13666.11	13694.92	41	41
196742	2018.01.01	00:02:00	2018-01-01 00:02:00	13682.00	13694.94	13680.00	13680.00	34	34
196743	2018.01.01	00:03:00	2018-01-01 00:03:00	13679.98	13679.98	13601.00	13645.99	86	86

In [116…
```
df.tail(3)
```

Out[116…

	Date	Time	DateTime	Open	High	Low	Close	Volume	TickVolum
2137234	2021.09.13	16:07:00	2021-09-13 16:07:00	44374.41	44374.41	44323.01	44351.37	831	83
2137235	2021.09.13	16:08:00	2021-09-13 16:08:00	44351.37	44400.05	44343.88	44360.69	1072	107

	Date	Time	DateTime	Open	High	Low	Close	Volume	TickVolum
2137236	2021.09.13	16:09:00	2021-09-13 16:09:00	44360.69	44374.92	44347.26	44347.27	583	58

Hour

In [117…
```
d = {'Open':'first', 'High':'max','Low':'min','Close':'last','Volume':'sum'}
df_hour = df.resample('1H', on='DateTime').agg(d)
df_hour.head(3)
```

Out[117…

DateTime	Open	High	Low	Close	Volume
2018-01-01 00:00:00	13707.91	13707.91	13400.01	13529.01	2842
2018-01-01 01:00:00	13528.99	13595.89	13155.38	13203.06	2873
2018-01-01 02:00:00	13203.00	13418.43	13200.00	13330.18	2859

In [118…
```
# calculate move percent
df_hour['Hour'] = df_hour.index.hour
df_hour['MovePercent'] = ((df_hour['High'] - df_hour['Low'])/df_hour['Open']) * 100.
df_hour.head(3)
```

Out[118…

DateTime	Open	High	Low	Close	Volume	Hour	MovePercent
2018-01-01 00:00:00	13707.91	13707.91	13400.01	13529.01	2842	0	2.246148
2018-01-01 01:00:00	13528.99	13595.89	13155.38	13203.06	2873	1	3.256045
2018-01-01 02:00:00	13203.00	13418.43	13200.00	13330.18	2859	2	1.654397

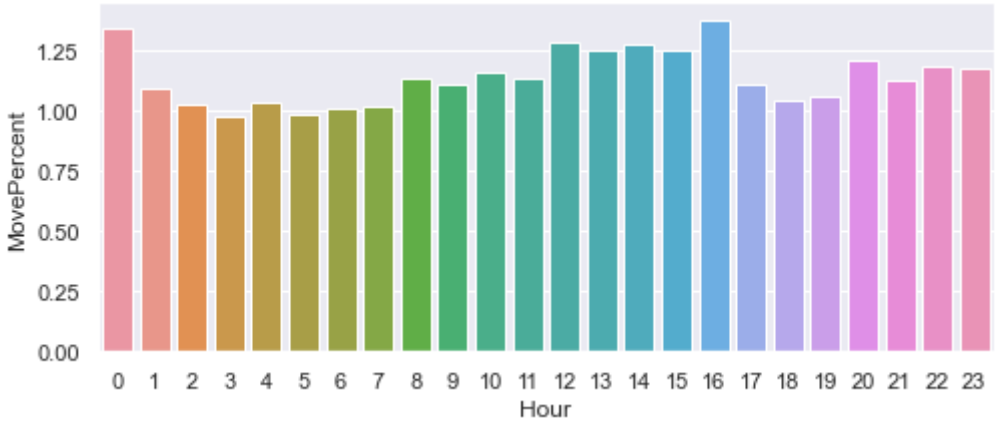
In [119…
```
df_group=df_hour.groupby('Hour').mean()
df_group.head(3)
```

Out[119…

Hour	Open	High	Low	Close	Volume	MovePercent
0	15447.948660	15566.287787	15322.619289	15450.331184	36528.203402	1.347805
1	15462.678377	15558.277910	15365.626175	15469.014285	30899.457840	1.097858
2	15439.642388	15517.082904	15341.345329	15425.377118	27880.481509	1.023742

In [120…
```
sns.set(rc={'figure.figsize':(8,3.2)})
sns.barplot(x=df_group.index, y=df_group['MovePercent'])
```

Out[120…
```
<AxesSubplot:xlabel='Hour', ylabel='MovePercent'>
```



Day

In [121…
```
d = {'Open':'first', 'High':'max','Low':'min','Close':'last','Volume':'sum'}
df_day = df.resample('1D', on='DateTime').agg(d)
df_day.head(3)
```

Out[121…

DateTime	Open	High	Low	Close	Volume
2018-01-01	13707.91	13818.55	12750.00	13380.00	68416
2018-01-02	13382.16	15473.49	12890.02	14675.11	70665
2018-01-03	14690.00	15307.56	14150.00	14919.51	69807

In [122…
```
# calculate move percent
df_day['DayNumber'] = df_day.index.dayofweek
df_day['MovePercent'] = ((df_day['High'] - df_day['Low'])/df_day['Open']) * 100.0
df_day.head(3)
```

Out[122…

DateTime	Open	High	Low	Close	Volume	DayNumber	MovePercent
2018-01-01	13707.91	13818.55	12750.00	13380.00	68416	0	7.795134
2018-01-02	13382.16	15473.49	12890.02	14675.11	70665	1	19.305329
2018-01-03	14690.00	15307.56	14150.00	14919.51	69807	2	7.879918

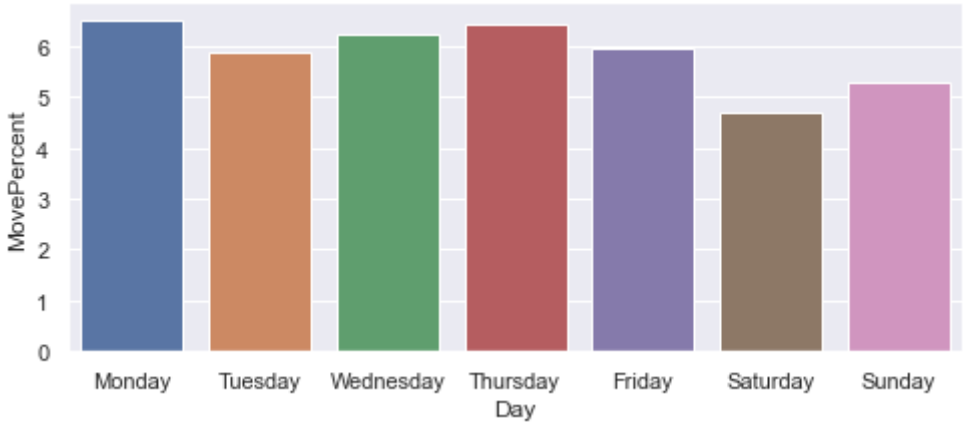
In [123…
```
df_group2=df_day.groupby('DayNumber').mean().sort_values(by=['DayNumber'], ascending
df_group2['Day'] = ''
for index in range (0,df_group2.shape[0]):
    df_group2.at[index,'Day'] = calendar.day_name[df_group2.index[index]]
df_group2.head(3)
```

Out[123…

DayNumber	Open	High	Low	Close	Volume	MovePercent
0	15509.496649	16053.895773	14898.895155	15542.436598	868614.247423	6.520773
1	15393.074819	15812.132642	14802.527358	15351.949119	822456.347150	5.879452
2	15352.110570	15902.245337	14789.446736	15415.803109	871835.393782	6.237662

In [124…
```
sns.set(rc={'figure.figsize':(8,3.2)})
sns.barplot(x=df_group2['Day'], y=df_group2['MovePercent'])
```

Out[124…
```
<AxesSubplot:xlabel='Day', ylabel='MovePercent'>
```



Month

In [125…
```
d = {'Open':'first', 'High':'max','Low':'min','Close':'last','Volume':'sum'}
df_month = df.resample('1MS', on='DateTime').agg(d)
df_month.head(3)
```

Out[125…

DateTime	Open	High	Low	Close	Volume
2018-01-01	13707.91	17176.24	9035.00	10285.10	2158823
2018-02-01	10285.10	11786.01	6000.01	10326.76	1852686
2018-03-01	10325.64	11710.00	6600.10	6923.91	2132309

In [126…
```
# calculate move percent
df_month['MonthNumber'] = df_month.index.month
df_month['MovePercent'] = ((df_month['High'] - df_month['Low'])/df_month['Open']) *
df_month.head(3)
```

Out[126…

DateTime	Open	High	Low	Close	Volume	MonthNumber	MovePercent
2018-01-01	13707.91	17176.24	9035.00	10285.10	2158823	1	59.390819
2018-02-01	10285.10	11786.01	6000.01	10326.76	1852686	2	56.256138
2018-03-01	10325.64	11710.00	6600.10	6923.91	2132309	3	49.487489

In [127…
```
df_group3=df_month.groupby('MonthNumber').mean().sort_values(by=['MonthNumber'], asc
df_group3['Month'] = ''
for index in range (0,df_group3.shape[0]):
    df_group3.at[df_group3.index[index],'Month'] = calendar.month_name[df_group3.ind
df_group3.head(3)
```

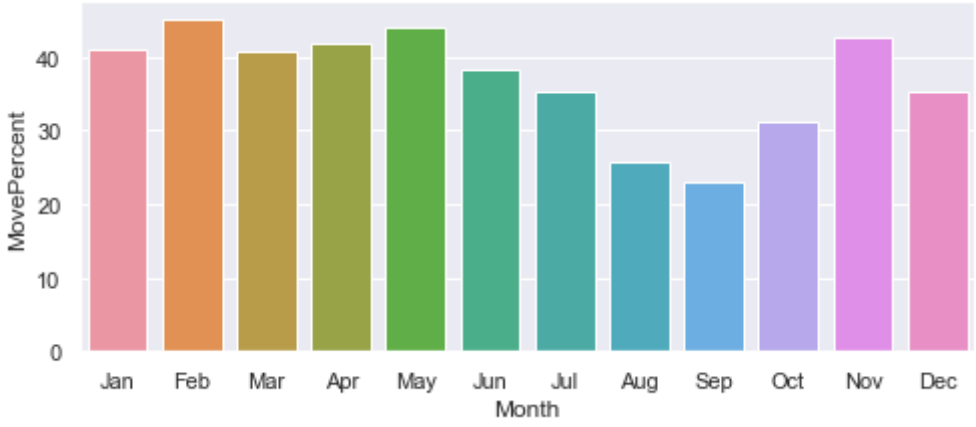
Out[127…

MonthNumber	Open	High	Low	Close	Volume	MovePercent	Month
1	13382.0025	18193.5100	11846.4900	14041.2675	31335902.75	41.060777	Jan
2	14040.9700	21209.2025	12528.5675	16949.9300	30482564.00	45.247317	Feb

MonthNumber	Open	High	Low	Close	Volume	MovePercent	Month
3	16949.4050	21720.5000	14750.8625	19044.7125	30212995.50	40.660845	Mar

In [128…
```
sns.set(rc={'figure.figsize':(8,3.2)})
sns.barplot(x=df_group3['Month'], y=df_group3['MovePercent'])
```

Out[128…
```
<AxesSubplot:xlabel='Month', ylabel='MovePercent'>
```



Months with diffrent bar for every year

In [129…
```
df_month['Year'] = df_month.index.year
df_month.head(3)
```

Out[129…

DateTime	Open	High	Low	Close	Volume	MonthNumber	MovePercent	Year
2018-01-01	13707.91	17176.24	9035.00	10285.10	2158823	1	59.390819	2018
2018-02-01	10285.10	11786.01	6000.01	10326.76	1852686	2	56.256138	2018
2018-03-01	10325.64	11710.00	6600.10	6923.91	2132309	3	49.487489	2018

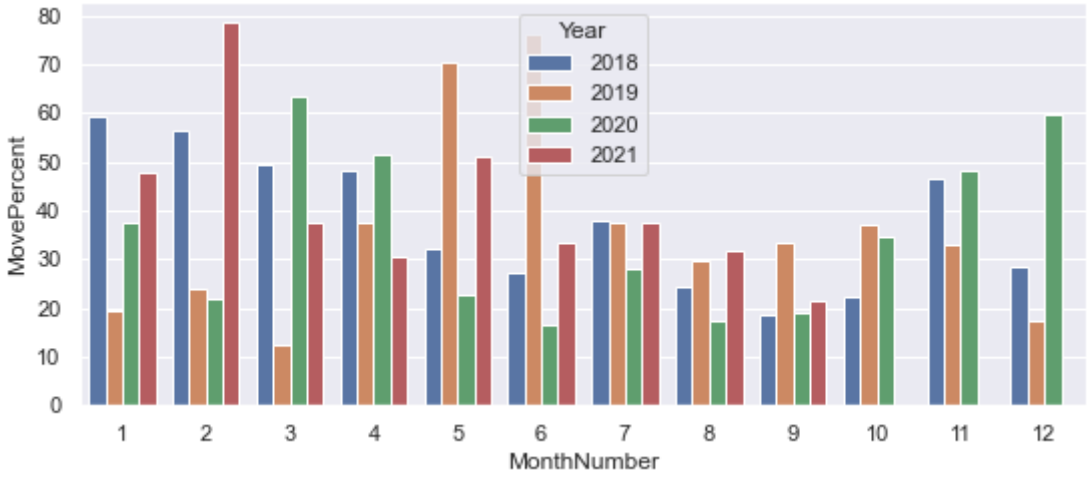
In [130…
```
df_group4=df_month.groupby(['Year','MonthNumber']).mean().sort_values(by=['Year','Mo
df_group4 = df_group4.reset_index()
df_group4.head(3)
```

Out[130…

	Year	MonthNumber	Open	High	Low	Close	Volume	MovePercent
0	2018	1	13707.91	17176.24	9035.00	10285.10	2158823	59.390819
1	2018	2	10285.10	11786.01	6000.01	10326.76	1852686	56.256138
2	2018	3	10325.64	11710.00	6600.10	6923.91	2132309	49.487489

In [131…
```
sns.set(rc={'figure.figsize':(9.0,3.7)})
sns.barplot(x=df_group4['MonthNumber'], y=df_group4['MovePercent'],hue=df_group4['Ye
```

Out[131…
```
<AxesSubplot:xlabel='MonthNumber', ylabel='MovePercent'>
```


Year
2018
2019
2020
2021
MovePercent
0
10
20
30
40
50
60
70
80
1
2
3
4
5
6
7
8
9
10
11
12
MonthNumber

In [ ]:

In [ ]:

In [ ]: