

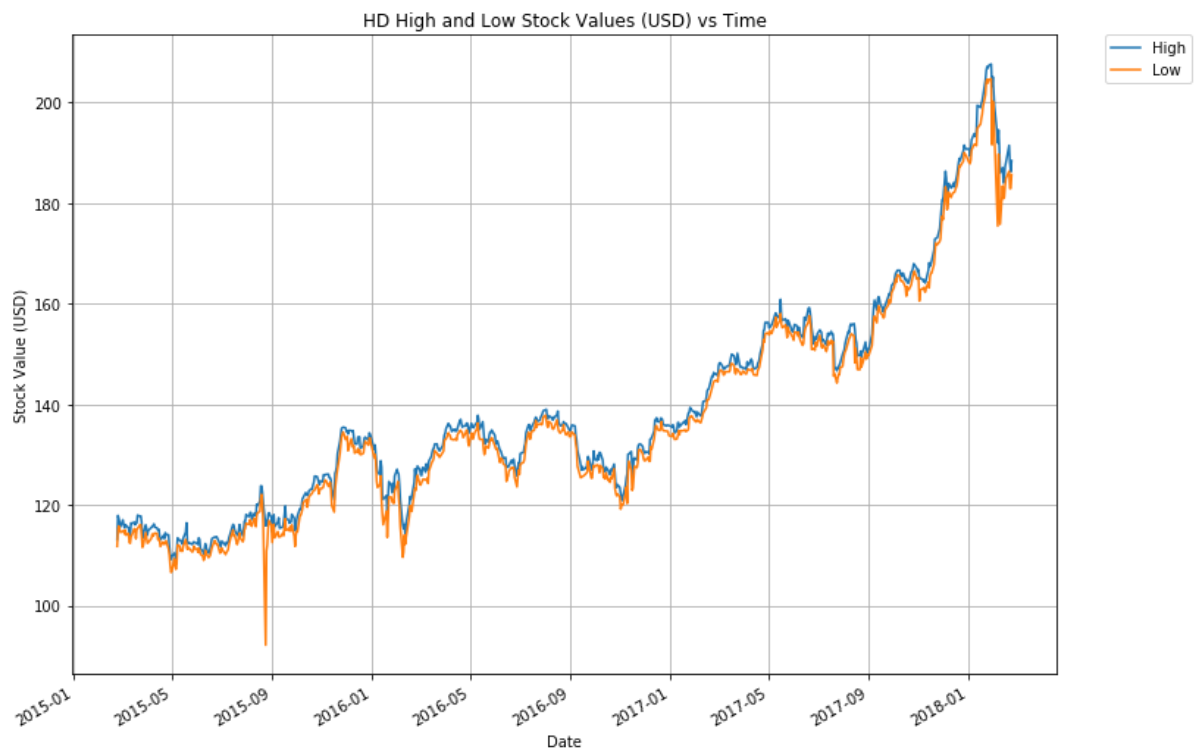
Vail Dorchester

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In [79]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

```
In [80]: path = './HD.csv'
df = pd.read_csv(path)

df['date'] = pd.to_datetime(df['date'])
df = df.sort_values(['date'])
```

```
In [81]: fig, ax = plt.subplots(figsize=(12,8))
plt.plot(df['date'], df['high'], label='High')#plot the highs
plt.plot(df['date'], df['low'], label='Low')#plot the lows
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.)#show the Legend
plt.xlabel('Date')#set xlabel
plt.ylabel('Stock Value (USD)')#set ylabel
plt.setp(ax.get_xticklabels(), rotation=30, horizontalalignment='right')#rotate x ticks
ax.grid()
ax.set_title("HD High and Low Stock Values (USD) vs Time")
plt.show()#show it
```

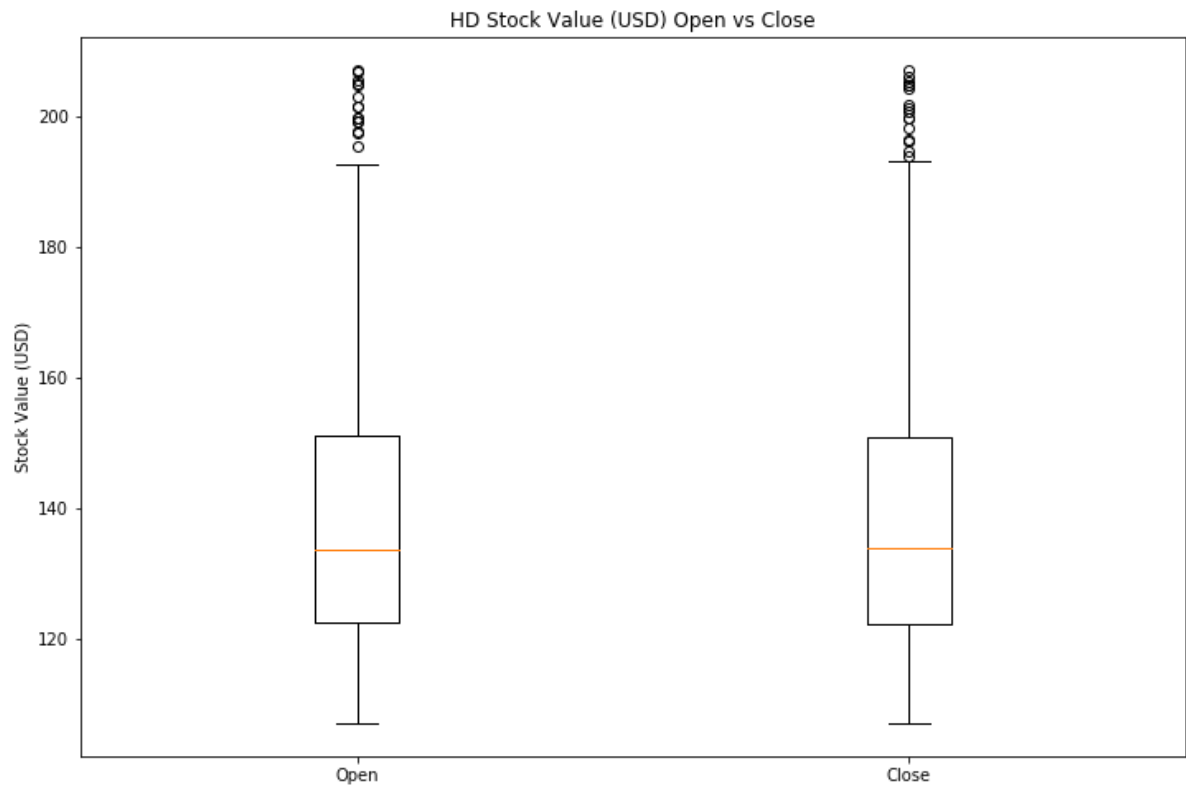


```
In [82]: # Initialize figure
fig, ax = plt.subplots(figsize=(12,8))

ax.set_title("HD Stock Value (USD) Open vs Close")
plt.ylabel("Stock Value (USD)")

bp = ax.boxplot([df['open'],df['close']])
ax.set_xticklabels(['Open','Close'])
```

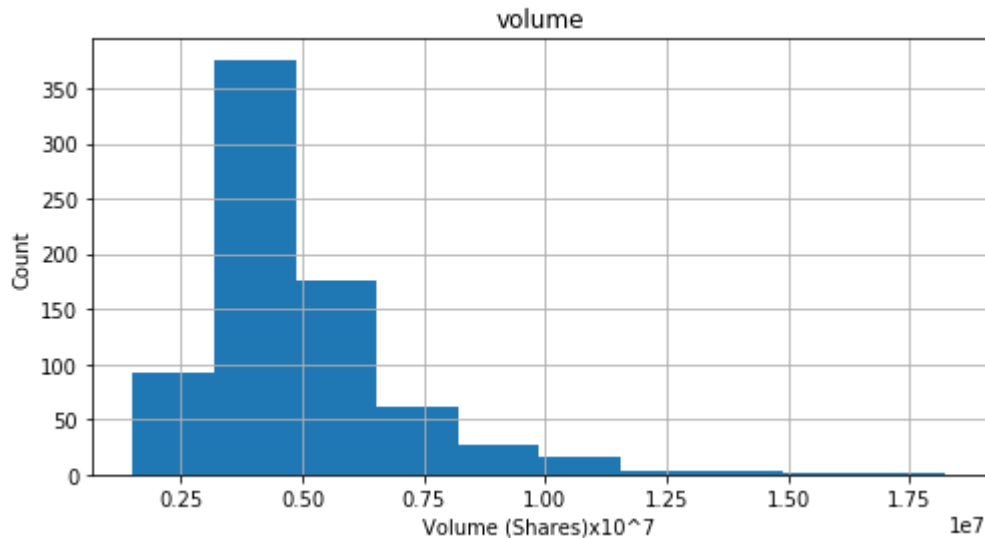
```
Out[82]: [Text(0,0,'Open'), Text(0,0,'Close')]
```



```
In [83]: # Initialize figure
fig, ax = plt.subplots(figsize=(8,4))

plt.ylabel('Count')
plt.xlabel('Volume (Shares)x10^7')
# Plot histogram
df.hist(column="volume", ax=ax, bins=10)
```

```
Out[83]: array([<matplotlib.axes._subplots.AxesSubplot object at 0x0000025725EB3A58>],
dtype=object)
```



```
In [84]: hmi = df['high'].min()
hma = df['high'].max()
lmi = df['low'].min()
lma = df['low'].max()
omi = df['open'].min()
oma = df['open'].max()
cmi = df['close'].min()
cma = df['close'].max()
vmi = df['volume'].min()
vma = df['volume'].max()

df["high_n"] = df["high"].apply(lambda s: ((s-hmi)/(hma-hmi))*(1-0)+(0))
df["low_n"] = df["low"].apply(lambda s: ((s-lmi)/(lma-lmi))*(1-0)+(0))
df["open_n"] = df["open"].apply(lambda s: ((s-omi)/(oma-omi))*(1-0)+(0))
df["close_n"] = df["close"].apply(lambda s: ((s-cmi)/(cma-cmi))*(1-0)+(0))
df["volume_n"] = df["volume"].apply(lambda s: ((s-vmi)/(vma-vmi))*(1-0)+(0))
```

```
In [86]: fig, ax = plt.subplots(figsize=(16,12))
plt.plot(df['date'], df['high_n'], label='High')#plot the highs
plt.plot(df['date'], df['low_n'], label='Low')#plot the lows
plt.plot(df['date'], df['open_n'], label='Open')#plot the highs
plt.plot(df['date'], df['close_n'], label='Close')#plot the lows
#plt.plot(df['date'], df['volume_n'], label='Volume')#plot the lows

plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.)#show the Legend
plt.xlabel('Date')#set xlabel
plt.ylabel('Stock Value (USD)')#set ylabel
plt.setp(ax.get_xticklabels(), rotation=30, horizontalalignment='right')#rotate x ticks
ax.grid()
ax.set_title("HD Min_Max Normalized High(USD), Low(USD), Open(USD) and Close(USD) vs Time")
plt.show()#show it
```

