In [1]:
```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
import seaborn as sns
```

In [2]:
```
nifty50=pd.read_csv('NIFTY50_all.csv')
```

In [3]:
```
nifty50.head()
```

Out[3]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
0	2007-11-27	MUNDRAPORT	EQ	440.00	770.00	1050.00	770.0	959.0	962.90	984.72	27294366	2.687719e+15	NaN	9859619.0	0.3612
1	2007-11-28	MUNDRAPORT	EQ	962.90	984.00	990.00	874.0	885.0	893.90	941.38	4581338	4.312765e+14	NaN	1453278.0	0.3172
2	2007-11-29	MUNDRAPORT	EQ	893.90	909.00	914.75	841.0	887.0	884.20	888.09	5124121	4.550658e+14	NaN	1069678.0	0.2088
3	2007-11-30	MUNDRAPORT	EQ	884.20	890.00	958.00	890.0	929.0	921.55	929.17	4609762	4.283257e+14	NaN	1260913.0	0.2735
4	2007-12-03	MUNDRAPORT	EQ	921.55	939.75	995.00	922.0	980.0	969.30	965.65	2977470	2.875200e+14	NaN	816123.0	0.2741

In [4]:
```
nifty50.tail()
```

Out[4]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
235187	2021-04-26	ZEEL	EQ	188.00	190.6	191.10	185.10	186.70	186.40	187.35	8542755	1.600451e+14	52374.0	2340188.0	0.2739
235188	2021-04-27	ZEEL	EQ	186.40	188.0	192.95	186.80	188.80	188.15	189.41	14247767	2.698636e+14	73673.0	5425957.0	0.3808
235189	2021-04-28	ZEEL	EQ	188.15	188.8	190.60	187.10	188.95	189.10	188.85	8429439	1.591917e+14	44056.0	2413974.0	0.2864
235190	2021-04-29	ZEEL	EQ	189.10	190.8	191.65	186.00	186.60	186.55	187.44	9483009	1.777471e+14	60932.0	2744472.0	0.2894
235191	2021-04-30	ZEEL	EQ	186.55	185.3	190.95	183.65	185.00	185.60	187.53	11435285	2.144440e+14	62607.0	3323909.0	0.2907

In [5]:
```
nifty50.shape
```

Out[5]: (235192, 15)

In [6]:
```
nifty50.describe()
```

Out[6]:

	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	
count	235192.000000	235192.000000	235192.000000	235192.000000	235192.000000	235192.000000	235192.00000	2.351920e+05	2.351920e+05	1.203
mean	1266.196349	1267.759708	1286.581440	1247.488465	1266.388302	1266.554351	1267.13230	3.045903e+06	1.610138e+14	6.196
std	2581.370320	2585.259609	2619.649216	2546.621396	2581.392543	2582.140942	2582.69998	7.333981e+06	3.298085e+14	6.866
min	0.000000	8.500000	9.750000	8.500000	9.100000	9.150000	9.21000	3.000000e+00	1.047000e+07	1.100
25%	274.300000	275.000000	279.500000	269.600000	274.400000	274.350000	274.69750	2.190095e+05	1.612816e+13	2.183
50%	566.500000	567.025000	576.900000	556.500000	567.000000	566.700000	566.94000	1.010938e+06	6.832603e+13	4.406
75%	1242.200000	1243.312500	1263.000000	1221.650000	1242.900000	1242.400000	1242.66250	3.019851e+06	1.863835e+14	7.893
max	32861.950000	33399.950000	33480.000000	32468.100000	32849.000000	32861.950000	32975.24000	4.810589e+08	3.564334e+16	1.643

In [28]:
```
nifty50['Symbol']=='HDFCBANK'
```

Out[28]:
```
0         False
1         False
2         False
3         False
4         False
          ...
235187    False
235188    False
235189    False
235190    False
235191    False
Name: Symbol, Length: 235192, dtype: bool
```

In [143]:
```
hdfcbank=nifty50[nifty50['Symbol']=='HDFCBANK']
```

In [144]:
```
hdfcbank.head()
```

Out[144]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
80365	2000-01-03	HDFCBANK	EQ	157.40	166.00	170.00	166.00	170.00	170.00	169.52	33259	5.638122e+11	NaN	NaN	NaN
80366	2000-01-04	HDFCBANK	EQ	170.00	182.00	183.45	171.00	174.00	173.80	174.99	168710	2.952261e+12	NaN	NaN	NaN
80367	2000-01-05	HDFCBANK	EQ	173.80	170.00	173.90	165.00	168.00	166.95	169.20	159820	2.704094e+12	NaN	NaN	NaN
80368	2000-01-06	HDFCBANK	EQ	166.95	168.00	170.00	165.30	168.95	168.30	168.44	85026	1.432166e+12	NaN	NaN	NaN
80369	2000-01-07	HDFCBANK	EQ	168.30	162.15	171.00	162.15	170.75	168.35	166.79	85144	1.420158e+12	NaN	NaN	NaN

In [145]:
```
hdfcbank.tail()
```

Out[145]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%D
85666	2021-04-26	HDFCBANK	EQ	1414.15	1413.00	1429.00	1402.75	1407.55	1404.8	1413.19	15085476	2.131861e+15	291268.0	9791881.0	
85667	2021-04-27	HDFCBANK	EQ	1404.80	1407.25	1442.00	1404.80	1435.05	1438.7	1430.40	10296453	1.472810e+15	233200.0	5650216.0	
85668	2021-04-28	HDFCBANK	EQ	1438.70	1436.25	1479.00	1431.00	1475.00	1476.8	1463.19	12051970	1.763438e+15	197146.0	7196647.0	
85669	2021-04-29	HDFCBANK	EQ	1476.80	1486.20	1503.65	1461.00	1471.65	1472.5	1481.15	12039276	1.783196e+15	252296.0	4818551.0	
85670	2021-04-30	HDFCBANK	EQ	1472.50	1445.00	1453.80	1407.50	1412.90	1412.3	1421.13	17616451	2.503529e+15	447876.0	8982938.0	

In [33]:
```
hdfcbank.describe()
```

Out[33]:

	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	[
count	5306.000000	5306.000000	5306.000000	5306.000000	5306.000000	5306.000000	5306.000000	5.306000e+03	5.306000e+03	2456.000000	4.7
mean	1007.093884	1007.472767	1019.986939	993.822211	1007.364003	1007.330390	1006.929263	2.102580e+06	2.448837e+14	82923.625407	1.2
std	635.757762	635.461516	641.444674	629.502818	635.722752	635.675021	635.481917	3.970048e+06	4.778103e+14	93575.061741	2.0
min	157.400000	162.150000	167.900000	157.000000	163.000000	163.400000	161.400000	1.042000e+03	2.291142e+10	807.000000	4.6
25%	479.912500	482.112500	486.912500	473.100000	480.700000	480.200000	479.512500	3.058325e+05	1.640025e+13	26850.500000	2.6
50%	934.750000	939.350000	953.950000	922.175000	935.600000	935.725000	937.455000	9.444650e+05	1.150443e+14	44227.000000	6.2
75%	1421.000000	1423.525000	1440.000000	1399.000000	1422.812500	1421.000000	1420.567500	2.123647e+06	2.154477e+14	104139.250000	1.4
max	2565.800000	2566.000000	2583.300000	2553.700000	2563.000000	2565.800000	2570.700000	1.005650e+08	1.426400e+16	790631.000000	6.6

In [35]:
```
hdfcbank.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 5306 entries, 80365 to 85670
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype  
---  ------              --------------  -----  
 0   Date                5306 non-null   object 
 1   Symbol              5306 non-null   object 
 2   Series              5306 non-null   object 
 3   Prev Close          5306 non-null   float64
 4   Open                5306 non-null   float64
 5   High                5306 non-null   float64
 6   Low                 5306 non-null   float64
 7   Last                5306 non-null   float64
 8   Close               5306 non-null   float64
 9   VWAP                5306 non-null   float64
 10  Volume              5306 non-null   int64  
 11  Turnover            5306 non-null   float64
 12  Trades              2456 non-null   float64
 13  Deliverable Volume  4797 non-null   float64
 14  %Deliverble         4797 non-null   float64
dtypes: float64(11), int64(1), object(3)
memory usage: 663.2+ KB
```

In [146]:
```
hdfcbank=hdfcbank.drop(['Series','Symbol'],axis=1)
```

In [147]:
```
hdfcbank.head()
```

Out[147]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
80365	2000-01-03	157.40	166.00	170.00	166.00	170.00	170.00	169.52	33259	5.638122e+11	NaN	NaN	NaN
80366	2000-01-04	170.00	182.00	183.45	171.00	174.00	173.80	174.99	168710	2.952261e+12	NaN	NaN	NaN
80367	2000-01-05	173.80	170.00	173.90	165.00	168.00	166.95	169.20	159820	2.704094e+12	NaN	NaN	NaN
80368	2000-01-06	166.95	168.00	170.00	165.30	168.95	168.30	168.44	85026	1.432166e+12	NaN	NaN	NaN
80369	2000-01-07	168.30	162.15	171.00	162.15	170.75	168.35	166.79	85144	1.420158e+12	NaN	NaN	NaN

In [38]:
```
hdfcbank.shape
```

Out[38]:
```
(5306, 13)
```

In [39]:
```
hdfcbank.isnull().sum()
```

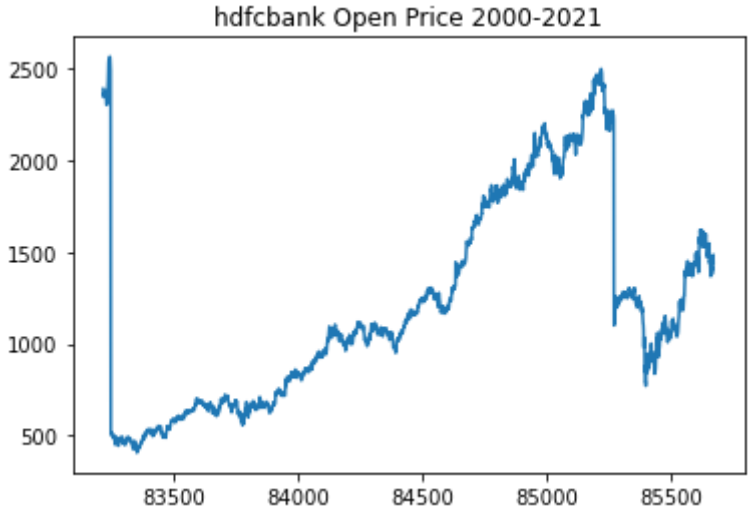
Out[39]:
```
Date                   0
Prev Close             0
Open                   0
High                   0
Low                    0
Last                   0
Close                  0
VWAP                   0
Volume                 0
Turnover               0
Trades              2850
Deliverable Volume   509
%Deliverble          509
dtype: int64
```

In [40]:
```
hdfcbank = hdfcbank.dropna()
```

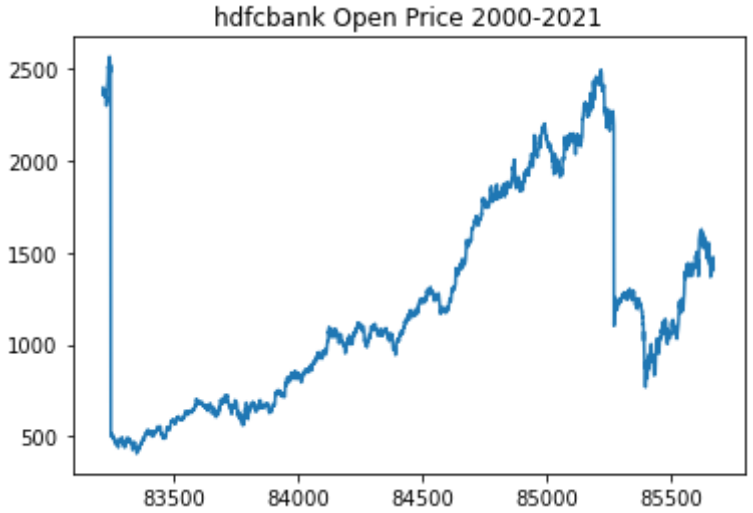
In [41]:
```
hdfcbank.isnull().sum()
```

Out[41]:
```
Date                 0
Prev Close           0
Open                 0
High                 0
Low                  0
Last                 0
Close                0
VWAP                 0
Volume               0
Turnover             0
Trades               0
Deliverable Volume   0
%Deliverble          0
dtype: int64
```

In [44]:
```
hdfcbank['Open'].plot()
plt.title("hdfcbank Open Price 2000-2021")
plt.show()
```



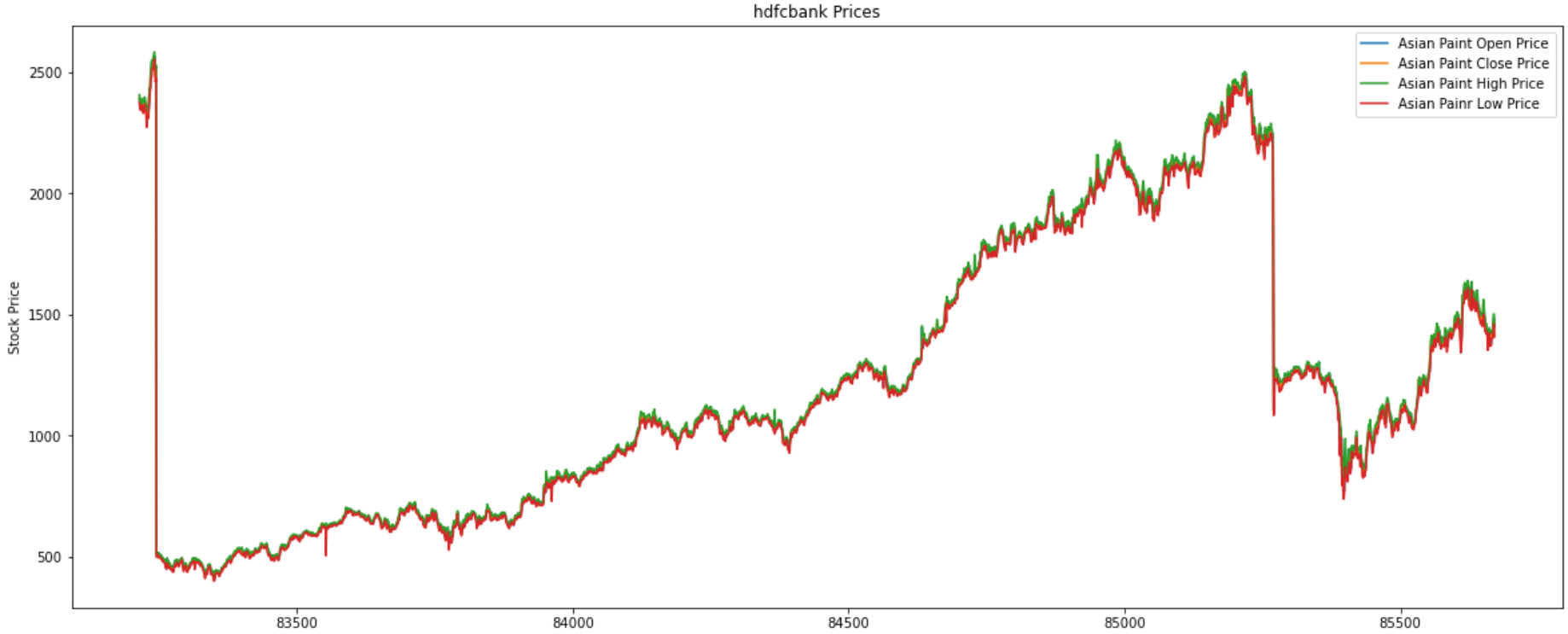
In [45]:
```
hdfcbank['Close'].plot()
plt.title("hdfcbank Open Price 2000-2021")
plt.show()
```



In [46]:
```
AvgHigh = hdfcbank.describe()['High']['mean']
AvgLow = hdfcbank.describe()['Low']['mean']
AvgVolume = hdfcbank.describe()['Volume']['mean']
AvgDeliverable_volume=hdfcbank.describe()['Deliverable Volume']['mean']

print("Average High hdfcbank Stock: ",AvgHigh,
      "\nAverage Low hdfcbank: ",AvgLow,
      "\nAverage Volume for hdfcbank: ", AvgVolume,
      "\nAverage Deliverable Volume of hdfcbank: ", AvgDeliverable_volume)
```

```
Average High hdfcbank Stock:  1216.20645358306
Average Low hdfcbank:  1193.5755700325758
Average Volume for hdfcbank:  3931527.3676710096
Average Deliverable Volume of hdfcbank:  2122648.167345277
```

In [52]:
```
plt.figure(figsize=(20,8));
hdfcbank['Open'].plot(label = 'Asian Paint Open Price')
hdfcbank['Close'].plot(label = 'Asian Paint Close Price')
hdfcbank['High'].plot(label= 'Asian Paint High Price')
hdfcbank['Low'].plot(label= 'Asian Painr Low Price')
plt.legend()
plt.title('hdfcbank Prices')
plt.ylabel("Stock Price")
plt.show()
```



In [149]:
```
start_date = "2020-04-30"
end_date = "2021-04-30"

mask = (hdfcbank['Date'] >= start_date) & (hdfcbank['Date'] <= end_date)
hdfcbank = hdfcbank.loc[mask]
hdfcbank = hdfcbank.reset_index()
hdfcbank = hdfcbank.drop(['index'], axis=1)
hdfcbank
```

Out[149]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
0	2020-04-30	977.10	1001.40	1019.00	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898
1	2020-05-04	1001.80	957.50	960.00	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675
2	2020-05-05	923.00	938.00	944.00	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268
3	2020-05-06	911.45	919.00	950.00	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468
4	2020-05-07	946.40	940.50	943.30	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114
...	...	...	...	...	...	...	...	...	...	...	...	...	...
246	2021-04-26	1414.15	1413.00	1429.00	1402.75	1407.55	1404.80	1413.19	15085476	2.131861e+15	291268.0	9791881.0	0.6491
247	2021-04-27	1404.80	1407.25	1442.00	1404.80	1435.05	1438.70	1430.40	10296453	1.472810e+15	233200.0	5650216.0	0.5488
248	2021-04-28	1438.70	1436.25	1479.00	1431.00	1475.00	1476.80	1463.19	12051970	1.763438e+15	197146.0	7196647.0	0.5971
249	2021-04-29	1476.80	1486.20	1503.65	1461.00	1471.65	1472.50	1481.15	12039276	1.783196e+15	252296.0	4818551.0	0.4002
250	2021-04-30	1472.50	1445.00	1453.80	1407.50	1412.90	1412.30	1421.13	17616451	2.503529e+15	447876.0	8982938.0	0.5099

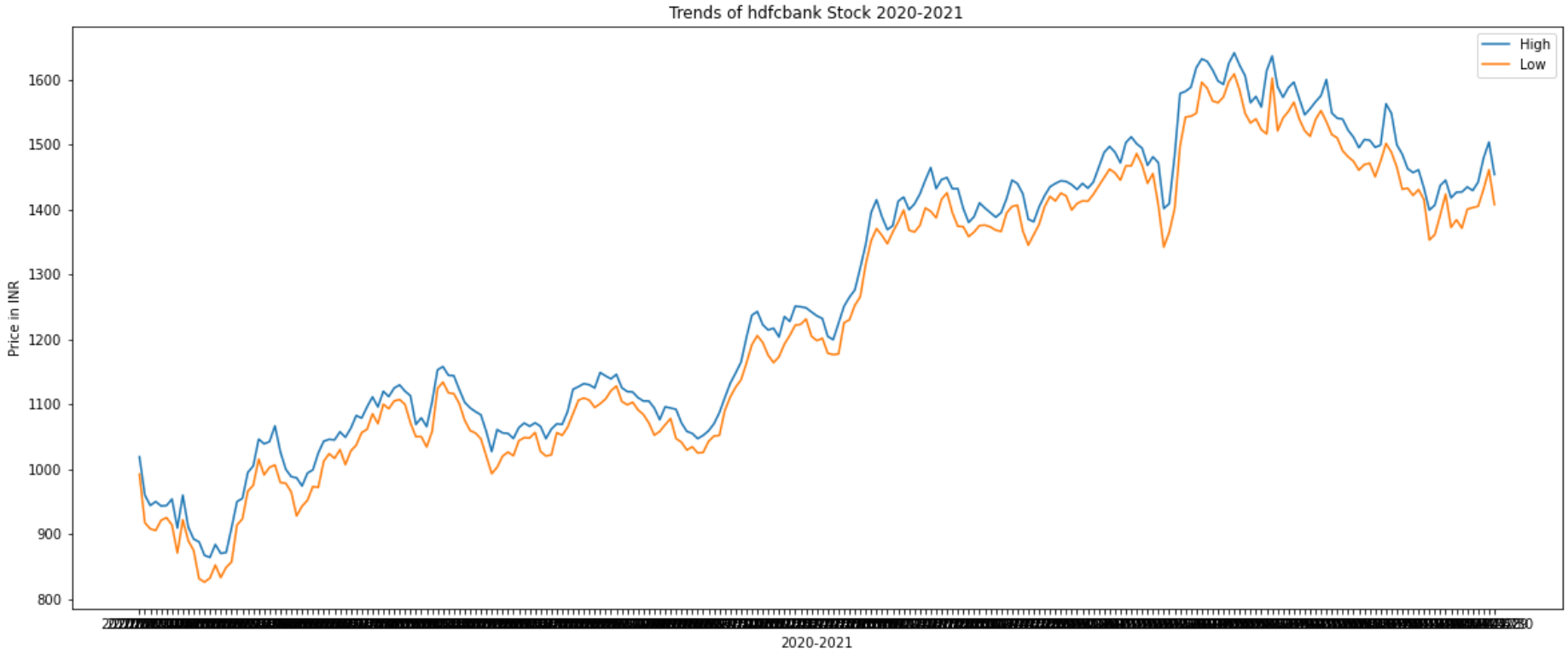
251 rows × 13 columns

In [66]:
```
plt.figure(figsize=(20,8));
hdfcbank['Open'].plot(label = 'hdfcbank Open Price')
hdfcbank['Close'].plot(label = 'hdfcbank Close Price')
hdfcbank['High'].plot(label= 'hdfcbank High Price')
hdfcbank['Low'].plot(label= 'hdfcbank Low Price')
plt.legend()
plt.title('hdfcbank Prices')
plt.ylabel("Stock Price")
plt.show()
```

In [64]:
```
AvgHigh = hdfcbank.describe()['High']['mean']
AvgLow = hdfcbank.describe()['Low']['mean']
AvgVolume = hdfcbank.describe()['Volume']['mean']
AvgDeliverable_volume=hdfcbank.describe()['Deliverable Volume']['mean']

print("Average High hdfcbank Stock: ",AvgHigh,
     "\nAverage Low hdfcbank: ",AvgLow,
     "\nAverage Volume for hdfcbank: ", AvgVolume,
     "\nAverage Deliverable Volume of hdfcbank: ", AvgDeliverable_volume)
```

```
Average High hdfcbank Stock:  1268.9667330677296
Average Low hdfcbank:  1235.3249003984063
Average Volume for hdfcbank:  13072625.93625498
Average Deliverable Volume of hdfcbank:  5419016.589641434
```

In [67]:
```
plt.figure(figsize=(20,8));
plt.plot(hdfcbank.Date, hdfcbank.High);
plt.plot(hdfcbank.Date, hdfcbank.Low);
plt.title("Trends of hdfcbank Stock 2020-2021");
plt.xlabel('2020-2021');
plt.ylabel('Price in INR');
plt.legend(['High','Low']);
plt.show()
```



In [74]:
```
max_high=hdfcbank.sort_values(by=['High'],ascending=False)
```

In [75]:
```
max_high.head()
```

Out[75]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
202	2021-02-16	1616.60	1621.20	1641.00	1608.45	1625.50	1626.65	1625.28	6948679	1.129354e+15	180673.0	1990683.0	0.2865
209	2021-02-25	1606.45	1609.75	1636.25	1602.00	1605.40	1606.40	1620.67	10054785	1.629546e+15	231264.0	4200723.0	0.4178
196	2021-02-08	1597.60	1620.00	1631.65	1595.70	1609.00	1605.25	1614.56	8723790	1.408508e+15	228373.0	3412505.0	0.3912
197	2021-02-09	1605.25	1610.00	1628.00	1586.70	1609.95	1611.85	1611.29	9210683	1.484106e+15	198426.0	3770007.0	0.4093
201	2021-02-15	1581.95	1600.10	1625.00	1596.70	1624.95	1616.60	1608.22	5177622	8.326777e+14	148039.0	1992888.0	0.3849

In [77]:
```
hdfcbank['High'].max()
```

Out[77]:
```
1641.0
```

In [81]:
```
hdfcbank['High'].min()
```

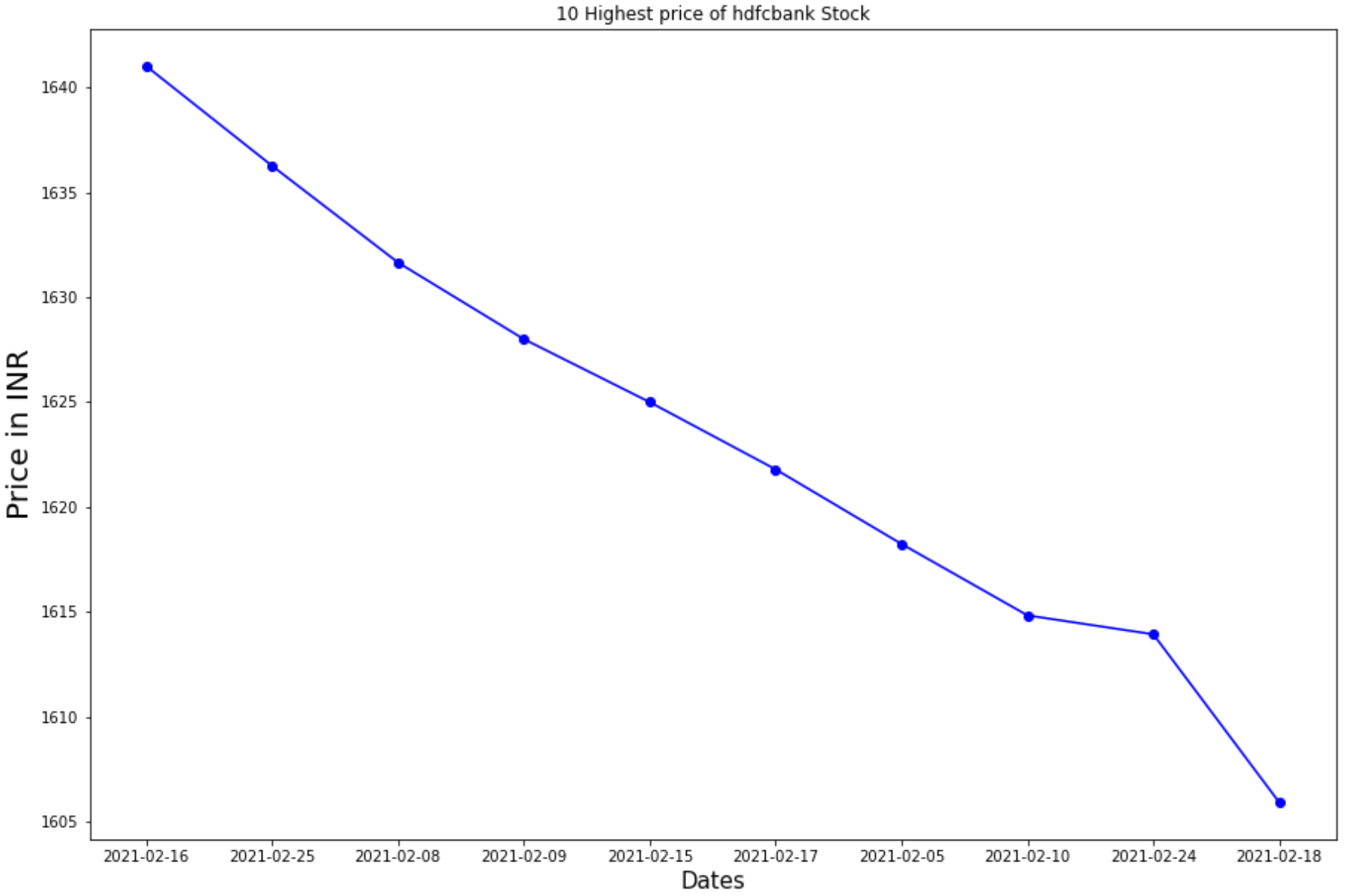
Out[81]:
```
864.0
```

In [88]:
```
high_10_price = hdfcbank.sort_values(by='High', ascending=False).head(10)
high_10_price
```

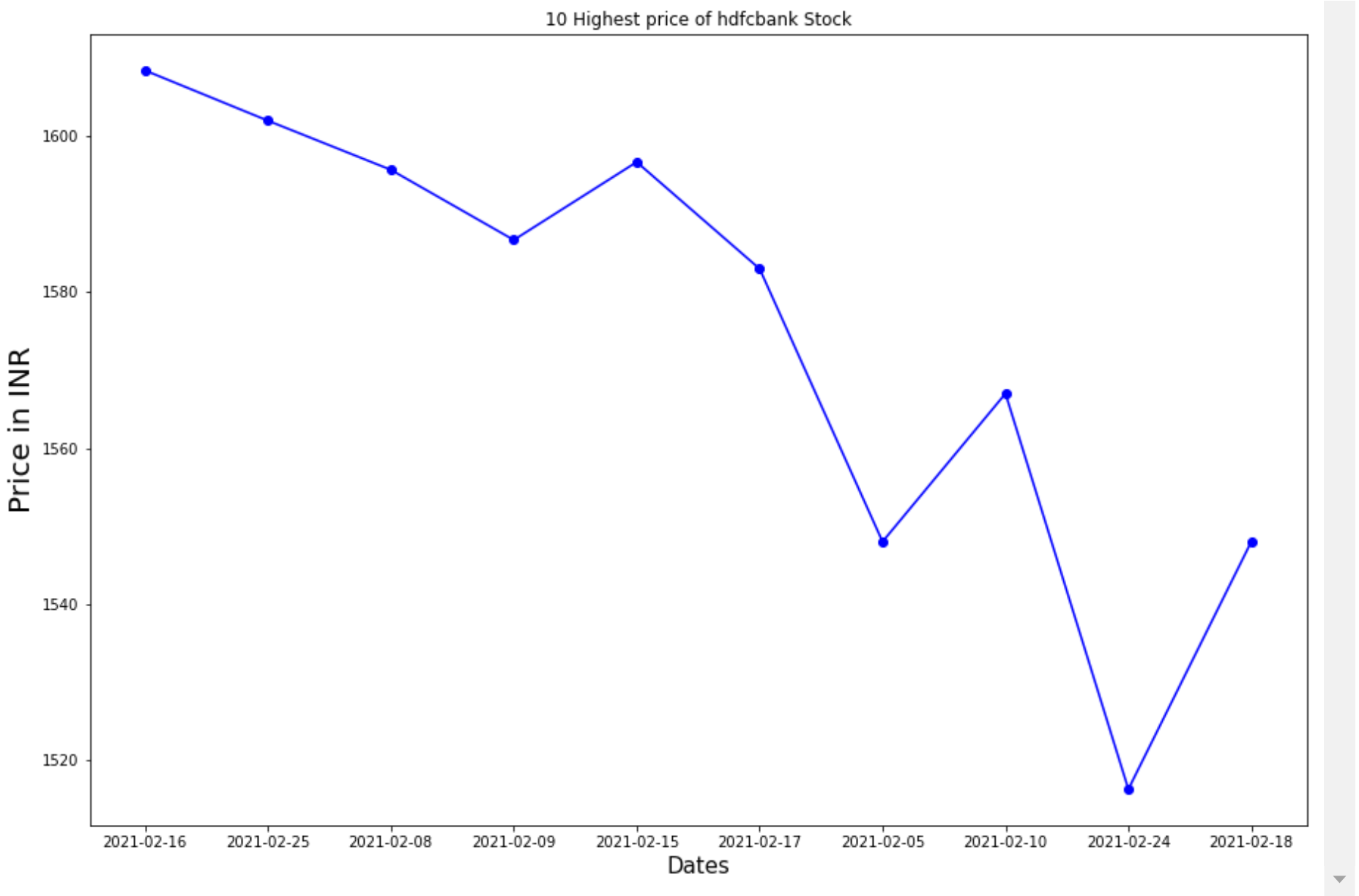
Out[88]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
202	2021-02-16	1616.60	1621.20	1641.00	1608.45	1625.50	1626.65	1625.28	6948679	1.129354e+15	180673.0	1990683.0	0.2865
209	2021-02-25	1606.45	1609.75	1636.25	1602.00	1605.40	1606.40	1620.67	10054785	1.629546e+15	231264.0	4200723.0	0.4178
196	2021-02-08	1597.60	1620.00	1631.65	1595.70	1609.00	1605.25	1614.56	8723790	1.408508e+15	228373.0	3412505.0	0.3912
197	2021-02-09	1605.25	1610.00	1628.00	1586.70	1609.95	1611.85	1611.29	9210683	1.484106e+15	198426.0	3770007.0	0.4093
201	2021-02-15	1581.95	1600.10	1625.00	1596.70	1624.95	1616.60	1608.22	5177622	8.326777e+14	148039.0	1992888.0	0.3849
203	2021-02-17	1626.65	1620.00	1621.80	1583.00	1586.20	1586.50	1602.21	6397213	1.024966e+15	154614.0	2731632.0	0.4270
195	2021-02-05	1579.10	1548.00	1618.25	1548.00	1597.20	1597.60	1595.45	13527358	2.158223e+15	274934.0	5044918.0	0.3729
198	2021-02-10	1611.85	1608.35	1614.85	1567.00	1592.50	1581.75	1592.85	9894003	1.575969e+15	229610.0	4736412.0	0.4787
208	2021-02-24	1529.15	1526.50	1613.95	1516.25	1612.00	1606.45	1561.95	7157166	1.117910e+15	144539.0	3318706.0	0.4637
204	2021-02-18	1586.50	1605.95	1605.95	1548.00	1559.00	1554.30	1570.90	7360280	1.156226e+15	260135.0	2557293.0	0.3474

In [125]:
```
#connecting highs of top 10 highest prices of hdfcbank
plt.figure(figsize=(15,10))
plt.plot(high_10_price.Date, high_10_price.High,'o-b');
plt.xlabel('Dates', size=15);
plt.ylabel('Price in INR', size=20);
plt.title('10 Highest price of hdfcbank Stock')
plt.show()
```


10 Highest price of hdfcbank Stock
Price in INR
1640
1635
1630
1625
1620
1615
1610
1605
2021-02-16
2021-02-25
2021-02-08
2021-02-09
2021-02-15
2021-02-17
2021-02-05
2021-02-10
2021-02-24
2021-02-18
Dates

In [126]:
```
#connecting lows of 10 highest prices of hdfcbank
plt.figure(figsize=(15,10))
plt.plot(high_10_price.Date, high_10_price.Low,'o-b');
plt.xlabel('Dates', size=15);
plt.ylabel('Price in INR', size=20);
plt.title('10 Highest price of hdfcbank Stock')
plt.show()
```

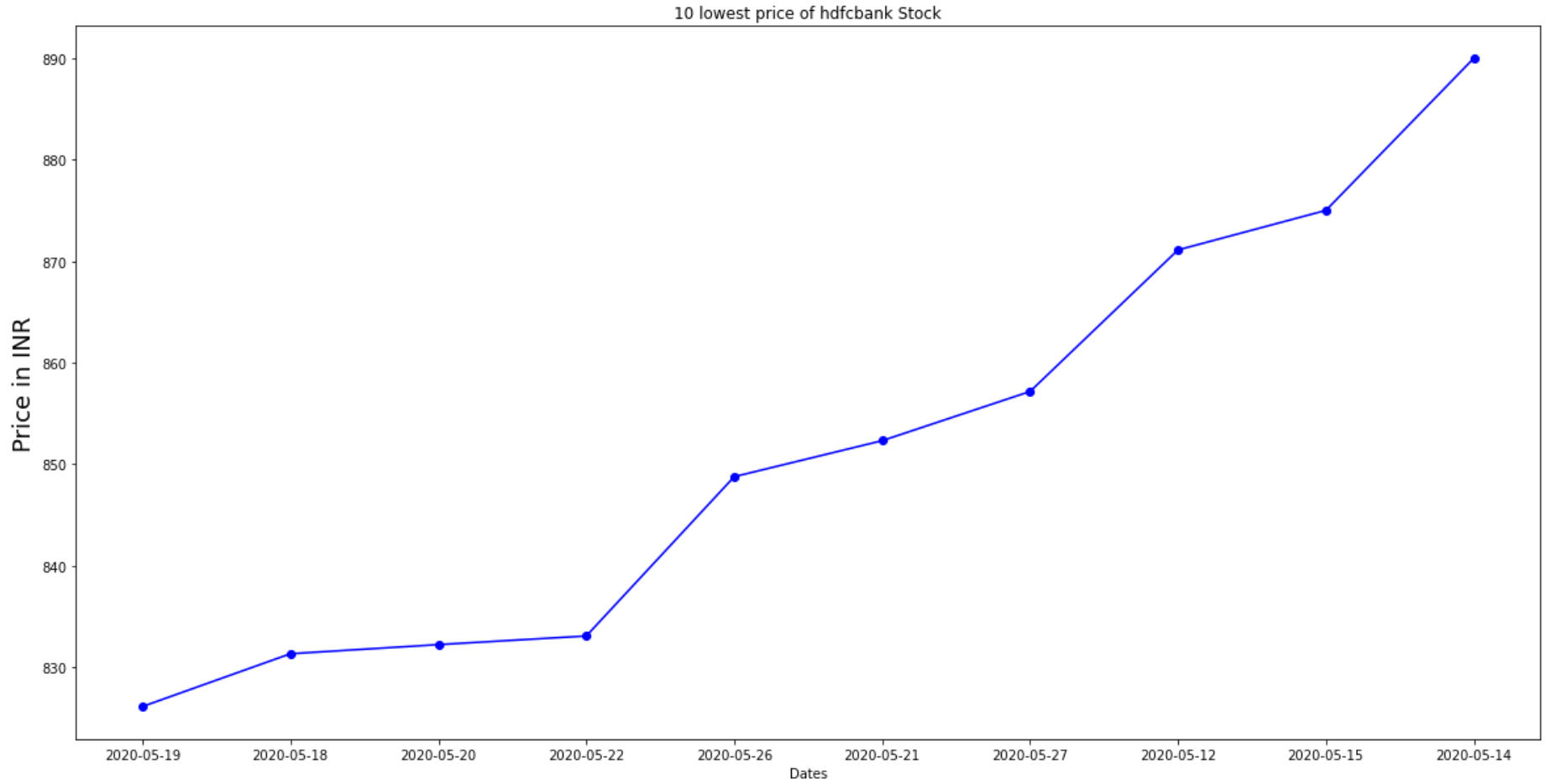

10 Highest price of hdfcbank Stock
Price in INR
1600
1580
1560
1540
1520
2021-02-16
2021-02-25
2021-02-08
2021-02-09
2021-02-15
2021-02-17
2021-02-05
2021-02-10
2021-02-24
2021-02-18
Dates

In [119]:
```
low_10_price= hdfcbank.sort_values(by='Low', ascending=True).head(10)
low_10_price
```

Out[119]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
12	2020-05-19	836.65	860.85	867.30	826.10	832.85	830.65	846.32	23730561	2.008377e+15	415550.0	8905443.0	0.3753
11	2020-05-18	888.15	888.00	888.00	831.30	838.00	836.65	847.83	23326656	1.977695e+15	533951.0	10660724.0	0.4570
13	2020-05-20	830.65	836.45	864.00	832.20	863.50	857.10	844.42	20007413	1.689474e+15	359835.0	8748975.0	0.4373
15	2020-05-22	859.55	850.00	870.30	833.05	842.65	838.85	844.52	21025849	1.775681e+15	382888.0	5893652.0	0.2803
16	2020-05-26	838.85	857.00	871.75	848.75	858.00	852.40	860.62	19002589	1.635402e+15	303415.0	7852814.0	0.4132
14	2020-05-21	857.10	861.45	884.00	852.30	860.40	859.55	870.64	24239683	2.110407e+15	416994.0	10837256.0	0.4471
17	2020-05-27	852.40	859.90	909.80	857.15	901.40	903.65	881.85	28013227	2.470358e+15	388895.0	11070917.0	0.3952
7	2020-05-12	915.80	901.00	909.40	871.10	902.50	901.55	888.33	24784324	2.201657e+15	516512.0	9460568.0	0.3817
10	2020-05-15	893.70	890.50	892.40	875.00	888.00	888.15	885.00	12174870	1.077480e+15	280499.0	4280446.0	0.3516
9	2020-05-14	927.65	898.00	911.00	890.00	893.85	893.70	899.79	19777445	1.779553e+15	364023.0	8394283.0	0.4244

In [127]:
```
plt.figure(figsize = (20,10));
plt.plot(low_10_price.Date, low_10_price.Low,'o-b');
plt.xlabel('Dates', size=10);
plt.ylabel('Price in INR', size=18);
plt.title('10 lowest price of hdfcbank Stock')
plt.show()
```



In [128]:
```
turnover=hdfcbank.sort_values(by=['Turnover'],ascending=False)
```

In [129]:
```
turnover.head(10)
```

Out[129]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
55	2020-07-20	1098.45	1135.0	1152.90	1124.15	1130.00	1133.05	1138.35	32562064	3.706709e+15	505889.0	11904108.0	0.3656
38	2020-06-25	1032.50	1021.9	1049.00	1007.00	1035.00	1028.75	1026.56	35323457	3.626152e+15	361881.0	16081355.0	0.4553
18	2020-05-28	903.65	920.0	950.00	913.95	947.50	945.25	938.36	37744926	3.541845e+15	631552.0	15665889.0	0.4150
192	2021-02-02	1476.75	1501.0	1578.50	1497.40	1560.50	1560.55	1556.51	21210103	3.301380e+15	416712.0	10262616.0	0.4839
182	2021-01-18	1466.65	1469.9	1502.85	1467.00	1480.00	1483.10	1488.94	21412816	3.188249e+15	483314.0	8069668.0	0.3769
66	2020-08-04	1002.00	1008.0	1061.05	1003.00	1040.20	1041.65	1039.32	30153418	3.133915e+15	472527.0	9249672.0	0.3068
26	2020-06-09	1015.90	1020.0	1026.75	979.55	984.45	987.30	1004.50	30922894	3.106206e+15	417245.0	13311975.0	0.4305
189	2021-01-28	1409.60	1389.9	1401.30	1342.00	1372.00	1371.45	1364.16	21352223	2.912789e+15	452148.0	10585667.0	0.4958
145	2020-11-24	1394.60	1408.0	1445.00	1402.05	1444.00	1438.20	1430.00	20077200	2.871049e+15	341801.0	10998578.0	0.5478
135	2020-11-10	1340.55	1357.0	1395.00	1351.55	1393.20	1393.65	1376.45	20758678	2.857319e+15	460114.0	10154953.0	0.4892

In [131]:
```
hdfcbank['Turnover'].max()
```

Out[131]: 3706709045255001.0

In [132]:
```
hdfcbank['Turnover'].min()
```

Out[132]: 125748512945000.0

In [133]:
```
hdfcbank['Volume'].max()
```

Out[133]: 37744926

In [134]:
```
hdfcbank['Volume'].min()
```

Out[134]: 917533

In [135]:
```
hdfcbank['Deliverable Volume'].sum()
```

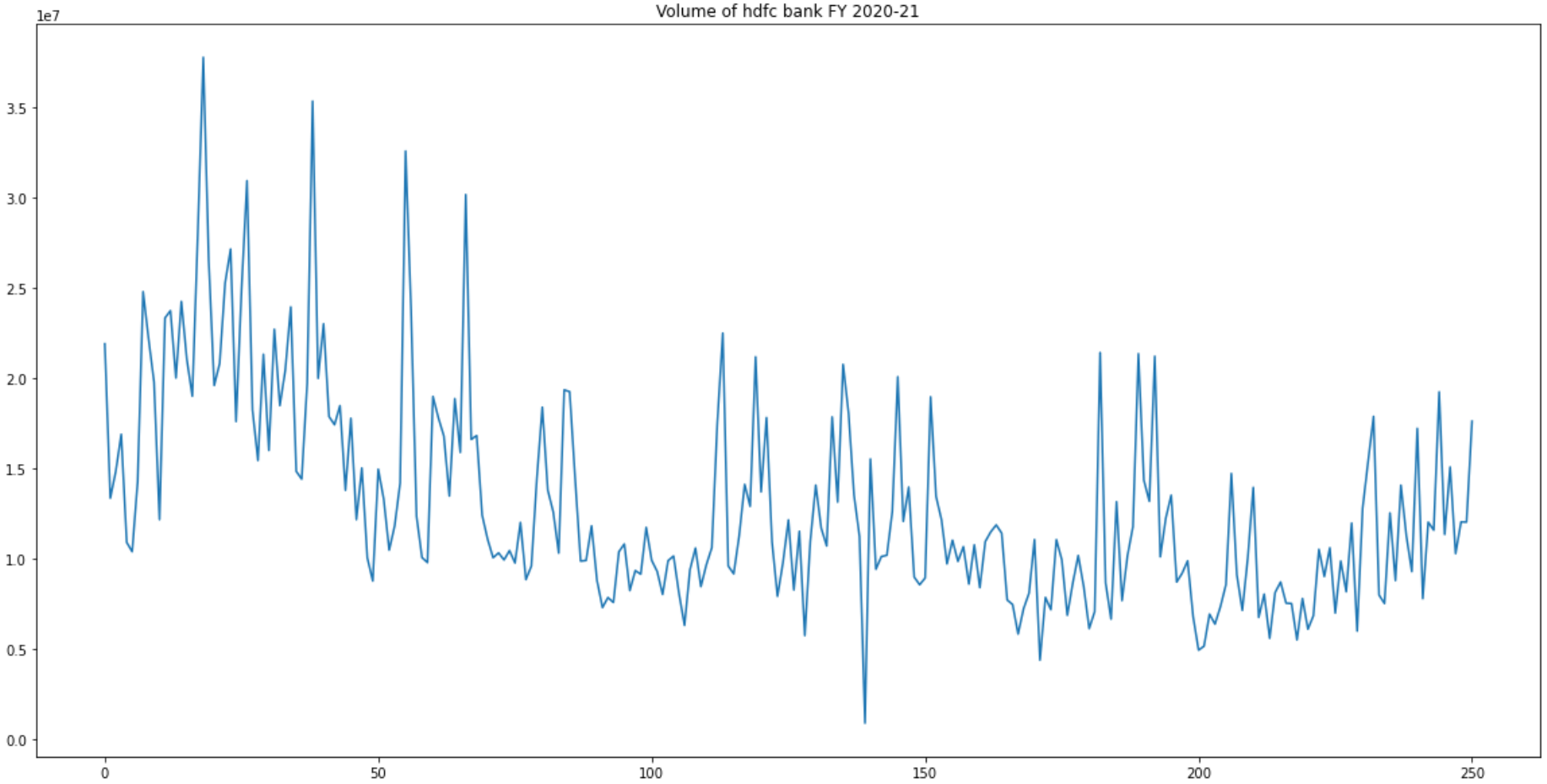
Out[135]: 1360173164.0

In [151]:
```
hdfcbank.head(5)
```

Out[151]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114

In [153]:
```
hdfcbank['Volume'].plot(figsize=(20,10))
plt.title("Volume of hdfc bank FY 2020-21")
plt.show()
```



In [157]:
```
# date at which there was highest volume of hdfcbank in FY 2020-21
hdfcbank.sort_values(by=['Volume'],ascending=False).head()['Date']
```

Out[157]:
```
18    2020-05-28
38    2020-06-25
55    2020-07-20
26    2020-06-09
66    2020-08-04
Name: Date, dtype: object
```

In [156]:
```
# date at which hdfcbank made high in FY 2020-21
hdfcbank.sort_values(by=['High'],ascending=False).head(1)['Date']
```

Out[156]:
```
202    2021-02-16
Name: Date, dtype: object
```

In [159]:
```
# date on which long term investors were crazy to buy Hdfcbank
hdfcbank.sort_values(by=['%Deliverble'],ascending=False).head(5)['Date']
```

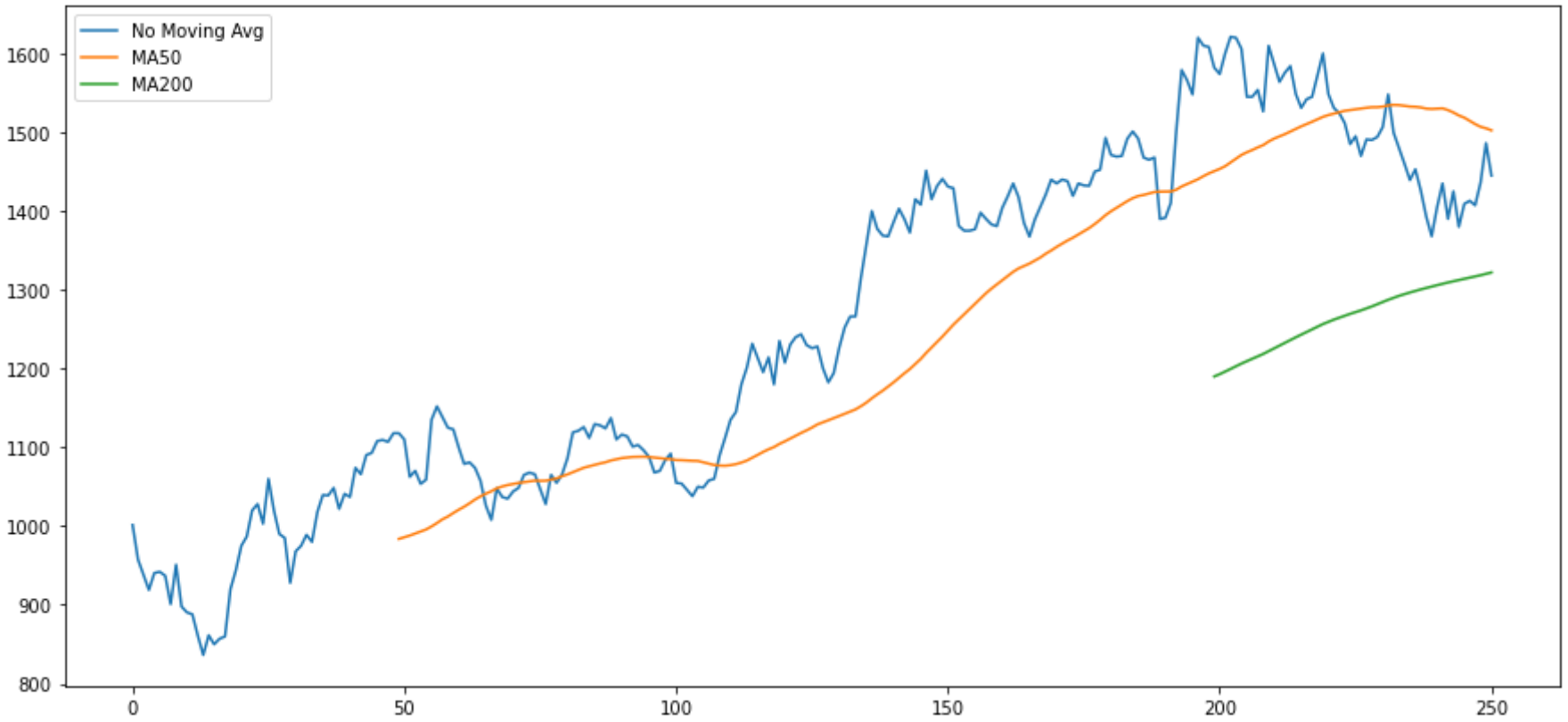
Out[159]:
```
246    2021-04-26
138    2020-11-13
56     2020-07-21
248    2021-04-28
235    2021-04-07
Name: Date, dtype: object
```

In [161]:
```
hdfcbank_ma=hdfcbank
hdfcbank_ma.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 251 entries, 0 to 250
Data columns (total 13 columns):
 #   Column              Non-Null Count  Dtype  
---  ------              --------------  -----  
 0   Date                251 non-null    object 
 1   Prev Close          251 non-null    float64
 2   Open                251 non-null    float64
 3   High                251 non-null    float64
 4   Low                 251 non-null    float64
 5   Last                251 non-null    float64
 6   Close               251 non-null    float64
 7   VWAP                251 non-null    float64
 8   Volume              251 non-null    int64  
 9   Turnover            251 non-null    float64
 10  Trades              251 non-null    float64
 11  Deliverable Volume  251 non-null    float64
 12  %Deliverble         251 non-null    float64
dtypes: float64(11), int64(1), object(1)
memory usage: 25.6+ KB
```

In [167]:
```
#plotting 50 & 200 MA on chart of hdfcbank stock
hdfcbank_ma['Open'].plot(label="No Moving Avg",figsize=(15,7))
hdfcbank_ma['MA50'] = hdfcbank_ma['Open'].rolling(50).mean()
hdfcbank_ma['MA50'].plot(label='MA50')

hdfcbank_ma['MA200'] = hdfcbank_ma['Open'].rolling(200).mean()
hdfcbank_ma['MA200'].plot(label='MA200')

plt.legend()
```

Out[167]: <matplotlib.legend.Legend at 0x23530098e50>



In [169]:
```
hdfcbank=hdfcbank_ma
```

In [170]:
```
hdfcbank.head()
```

Out[170]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN

In [171]:
```
#intraday volumes
```

In [172]:
```
hdfcbank['Intraday Volumes']=hdfcbank['Volume']-hdfcbank['Deliverable Volume']
```

In [174]:
```
hdfcbank.head(10)
```

Out[174]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	
0	2020-04-30	977.10	1001.4	1019.00	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN	1
1	2020-05-04	1001.80	957.5	960.00	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN	
2	2020-05-05	923.00	938.0	944.00	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN	
3	2020-05-06	911.45	919.0	950.00	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN	1
4	2020-05-07	946.40	940.5	943.30	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN	
5	2020-05-08	925.00	942.0	943.95	925.20	930.00	929.05	932.46	10403747	9.701069e+14	176643.0	3723731.0	0.3579	NaN	NaN	
6	2020-05-11	929.05	937.0	954.00	914.00	915.90	915.80	934.32	14275392	1.333776e+15	316129.0	5926950.0	0.4152	NaN	NaN	
7	2020-05-12	915.80	901.0	909.40	871.10	902.50	901.55	888.33	24784324	2.201657e+15	516512.0	9460568.0	0.3817	NaN	NaN	1
8	2020-05-13	901.55	951.0	960.00	922.10	928.95	927.65	938.46	22173554	2.080901e+15	396148.0	9094925.0	0.4102	NaN	NaN	1
9	2020-05-14	927.65	898.0	911.00	890.00	893.85	893.70	899.79	19777445	1.779553e+15	364023.0	8394283.0	0.4244	NaN	NaN	1

In [175]:
```
hdfcbank['Intraday Volumes'].max()
```

Out[175]:
```
22079037.0
```

In [176]:
```
hdfcbank.sort_values(by=['Intraday Volumes'],ascending=False).head(5)['Date']
```

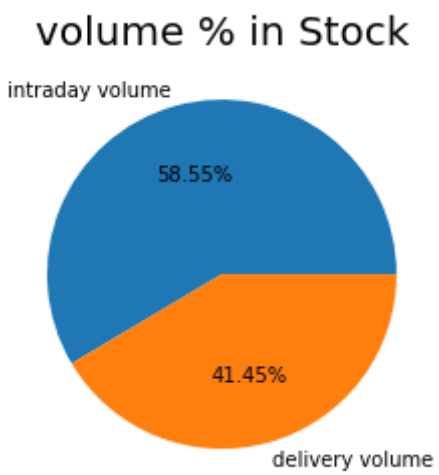
Out[176]:
```
18    2020-05-28
66    2020-08-04
55    2020-07-20
38    2020-06-25
23    2020-06-04
Name: Date, dtype: object
```

In [178]:
```
hdfcbank.sort_values(by=['Deliverable Volume'],ascending=False).head(5)['Date']
```

Out[178]:
```
38    2020-06-25
18    2020-05-28
56    2020-07-21
26    2020-06-09
55    2020-07-20
Name: Date, dtype: object
```

In [183]:
```
# % volumes of stock
```

In [196]:
```
values=[hdfcbank['Intraday Volumes'].sum(),hdfcbank['Deliverable Volume'].sum()]
names=['intraday volume','delivery volume']
plt.pie(values,labels=names,autopct='%1.2f%%')
plt.title("volume % in Stock",size=20)
plt.show()
```



In [197]:
```
#calculating returns given by stock
```

In [198]:
```
hdfcbank_ma.head(5)
```

Out[198]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN	13
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN	7
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN	9
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN	12
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN	7

In [232]:
```
#daily returns = (today's price - yesterday's price)/yesterday's price

hdfcbank_ma['Returns']=(hdfcbank_ma['Close']/ hdfcbank_ma['Close'].shift(1)) - 1
hdfcbank_ma.head()
```

Out[232]:

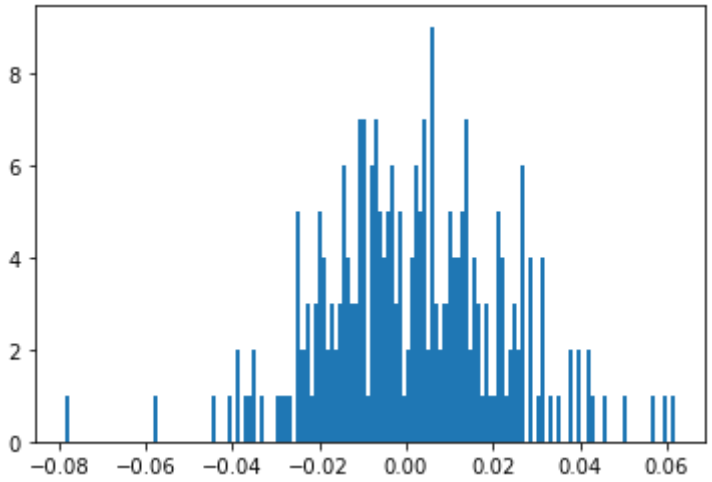
	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN	13
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN	7
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN	9
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN	12
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN	7

In [217]:
```
hdfcbank_ma.sort_values(by=['Returns'],ascending =False).head(10)
```

Out[217]:

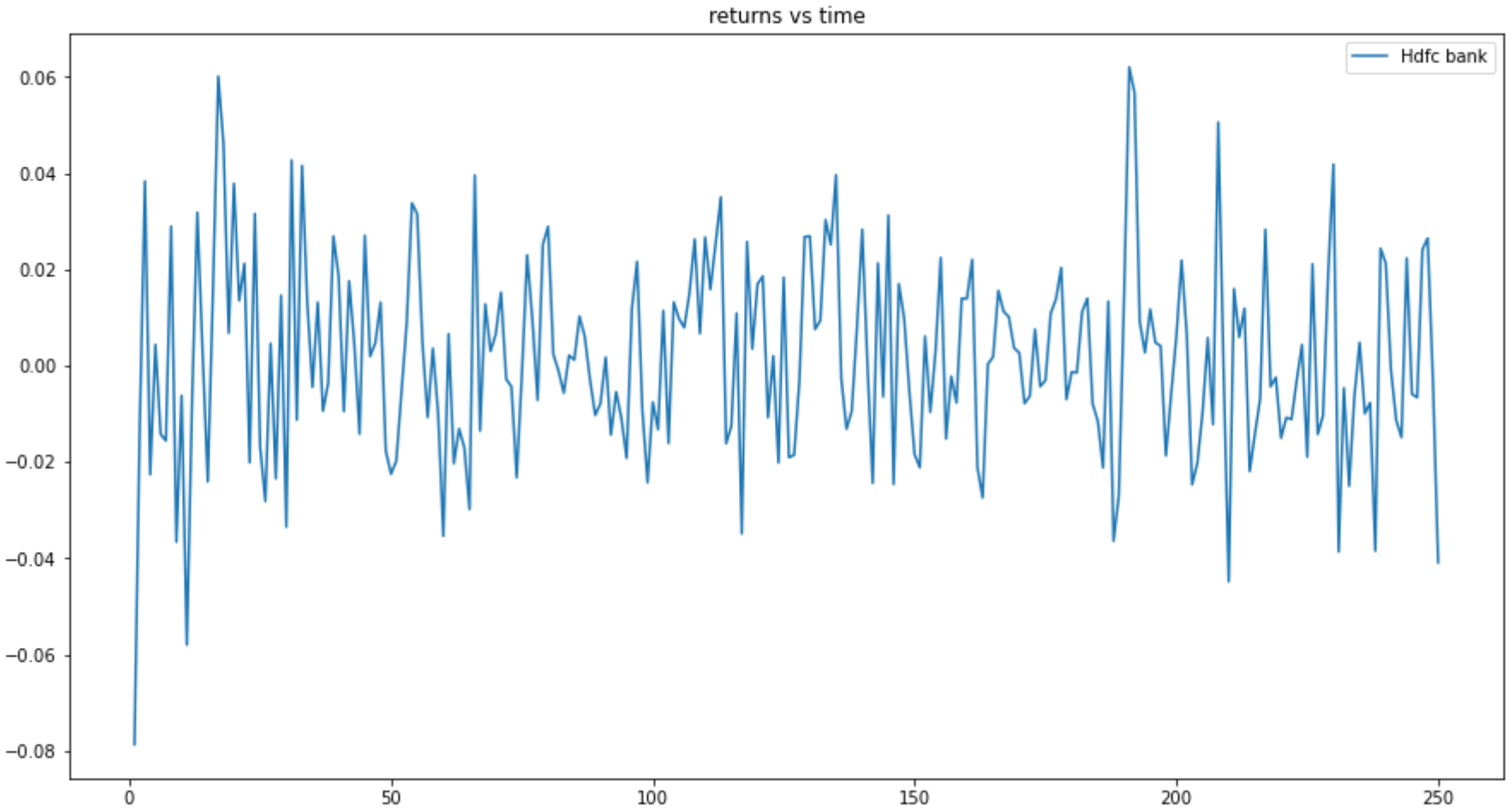
ve	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	Intraday Volumes	
0	1410.25	1482.50	1401.00	1480.00	1476.75	1439.43	13185272	1.897923e+15	301952.0	6454236.0	0.4895	1424.828	NaN	6731036.0	0
0	859.90	909.80	857.15	901.40	903.65	881.85	28013227	2.470358e+15	388895.0	11070917.0	0.3952	NaN	NaN	16942310.0	0
5	1501.00	1578.50	1497.40	1560.50	1560.55	1556.51	21210103	3.301380e+15	416712.0	10262616.0	0.4839	1427.054	NaN	10947487.0	0
5	1526.50	1613.95	1516.25	1612.00	1606.45	1561.95	7157166	1.117910e+15	144539.0	3318706.0	0.4637	1483.677	1218.56	3838460.0	0
5	920.00	950.00	913.95	947.50	945.25	938.36	37744926	3.541845e+15	631552.0	15665889.0	0.4150	NaN	NaN	22079037.0	0
5	975.00	993.95	952.00	989.15	990.40	978.56	22700113	2.221335e+15	318791.0	6682870.0	0.2944	NaN	NaN	16017243.0	0
0	1506.65	1562.55	1501.55	1548.80	1553.70	1537.72	12804032	1.968905e+15	229161.0	7304263.0	0.5705	1532.562	1284.44	5499769.0	0
5	980.00	1024.90	972.00	1017.60	1019.95	998.66	20435469	2.040802e+15	283491.0	4678708.0	0.2290	NaN	NaN	15756761.0	0
5	1357.00	1395.00	1351.55	1393.20	1393.65	1376.45	20758678	2.857319e+15	460114.0	10154953.0	0.4892	1156.816	NaN	10603725.0	0
0	1008.00	1061.05	1003.00	1040.20	1041.65	1039.32	30153418	3.133915e+15	472527.0	9249672.0	0.3068	1044.286	NaN	20903746.0	0

In [225]:
```
plt.hist(hdfcbank_ma['Returns'],bins=150)
plt.show()
```



In [229]:
```
hdfcbank_ma['Returns'].plot(label='Hdfc bank',figsize=(15,8))
plt.title("returns vs time")
plt.legend()
```

Out[229]:
```
<matplotlib.legend.Legend at 0x2353109a760>
```



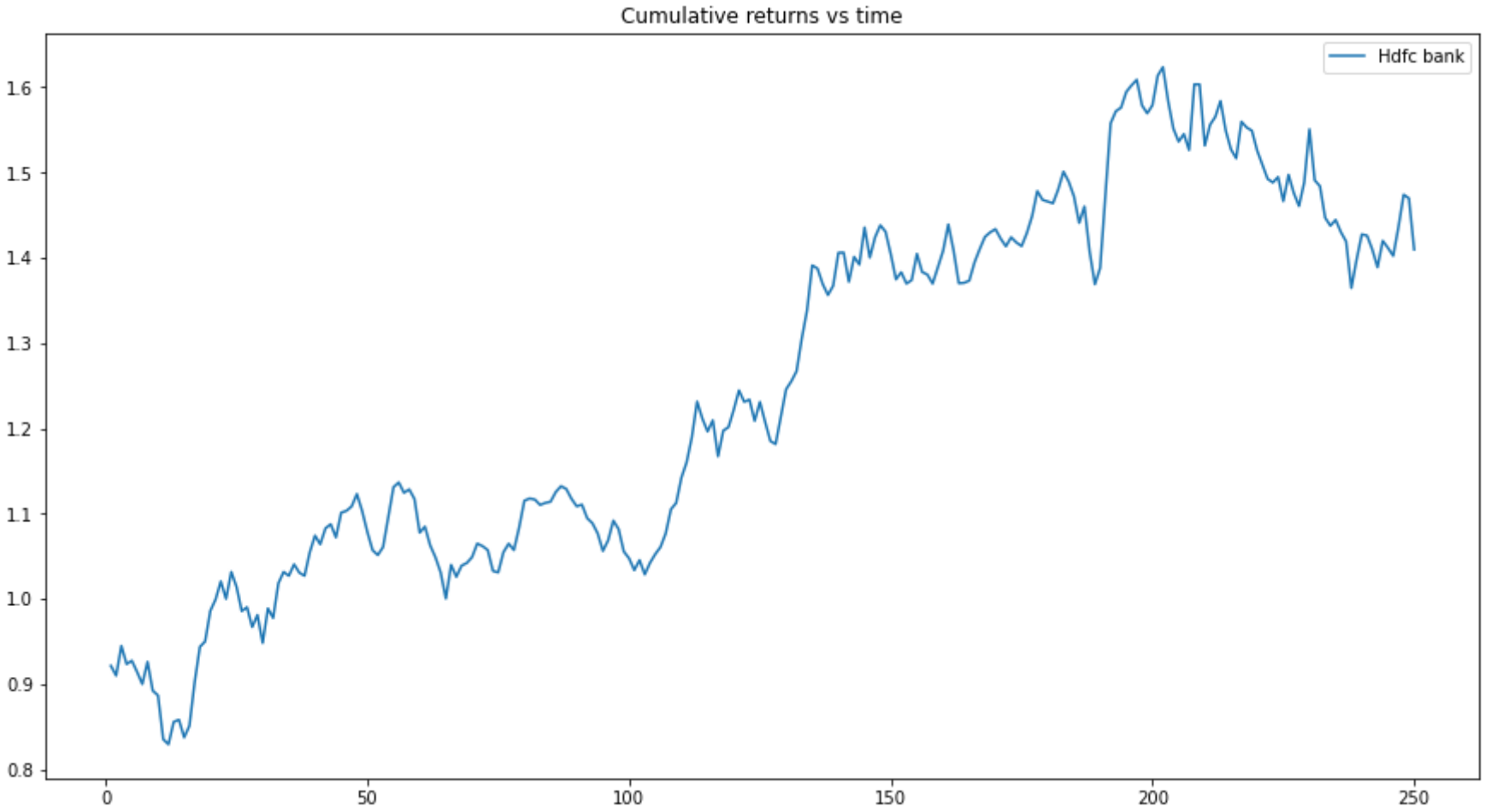
In [233]:
```
# cumulative returns means entire amount of money an investment has earned for an investor, irrespective of time
# it adds daily returns
# cumulative return = (current price - daily price)/daily price

hdfcbank_ma['Cumulative Return'] = (1 + hdfcbank_ma['Returns']).cumprod()
hdfcbank_ma.head()
```

Out[233]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN	13
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN	7
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN	9
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN	12
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN	7

In [231]:
```
hdfcbank_ma['Cumulative Return'].plot(label='Hdfc bank',figsize=(15,8))
plt.title("Cumulative returns vs time")
plt.legend()
```

Out[231]:
```
<matplotlib.legend.Legend at 0x23530dca3a0>
```



In [236]:
```
hdfcbank_ma.sort_values(by=['Cumulative Return'],ascending=False).head(10)
```

Out[236]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	
202	2021-02-16	1616.60	1621.20	1641.00	1608.45	1625.50	1626.65	1625.28	6948679	1.129354e+15	180673.0	1990683.0	0.2865	1461.713	11
201	2021-02-15	1581.95	1600.10	1625.00	1596.70	1624.95	1616.60	1608.22	5177622	8.326777e+14	148039.0	1992888.0	0.3849	1456.909	11
197	2021-02-09	1605.25	1610.00	1628.00	1586.70	1609.95	1611.85	1611.29	9210683	1.484106e+15	198426.0	3770007.0	0.4093	1444.275	
208	2021-02-24	1529.15	1526.50	1613.95	1516.25	1612.00	1606.45	1561.95	7157166	1.117910e+15	144539.0	3318706.0	0.4637	1483.677	12
209	2021-02-25	1606.45	1609.75	1636.25	1602.00	1605.40	1606.40	1620.67	10054785	1.629546e+15	231264.0	4200723.0	0.4178	1488.256	12
196	2021-02-08	1597.60	1620.00	1631.65	1595.70	1609.00	1605.25	1614.56	8723790	1.408508e+15	228373.0	3412505.0	0.3912	1440.375	
195	2021-02-05	1579.10	1548.00	1618.25	1548.00	1597.20	1597.60	1595.45	13527358	2.158223e+15	274934.0	5044918.0	0.3729	1437.001	
213	2021-03-03	1568.20	1584.00	1596.00	1565.00	1587.00	1586.85	1579.75	5611205	8.864315e+14	190986.0	2757159.0	0.4914	1500.969	12
203	2021-02-17	1626.65	1620.00	1621.80	1583.00	1586.20	1586.50	1602.21	6397213	1.024966e+15	154614.0	2731632.0	0.4270	1466.613	12
200	2021-02-12	1572.35	1573.90	1592.50	1573.00	1589.55	1581.95	1584.36	4955053	7.850573e+14	164667.0	1476085.0	0.2979	1453.487	11

In [238]:
```
hdfcbank_ma.head()
```

Out[238]:

	Date	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	
0	2020-04-30	977.10	1001.4	1019.0	992.10	1000.00	1001.80	1006.05	21897643	2.203013e+15	451072.0	8534959.0	0.3898	NaN	NaN	13
1	2020-05-04	1001.80	957.5	960.0	917.50	924.90	923.00	932.42	13361177	1.245817e+15	383166.0	6246738.0	0.4675	NaN	NaN	7
2	2020-05-05	923.00	938.0	944.0	908.05	914.50	911.45	928.05	14837190	1.376958e+15	298424.0	4848835.0	0.3268	NaN	NaN	9
3	2020-05-06	911.45	919.0	950.0	905.65	946.55	946.40	936.39	16893140	1.581850e+15	310813.0	4169602.0	0.2468	NaN	NaN	12
4	2020-05-07	946.40	940.5	943.3	921.35	927.30	925.00	930.31	10916003	1.015531e+15	226640.0	3399155.0	0.3114	NaN	NaN	7

In [239]:
```
hdfcbank_ma.tail()
```

Out[239]:

jh	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble	MA50	MA200	Intraday Volumes	Returns	Cumula Re
)0	1402.75	1407.55	1404.8	1413.19	15085476	2.131861e+15	291268.0	9791881.0	0.6491	1514.429	1315.41175	5293595.0	-0.006612	1.40
)0	1404.80	1435.05	1438.7	1430.40	10296453	1.472810e+15	233200.0	5650216.0	0.5488	1510.374	1316.91300	4646237.0	0.024132	1.43
)0	1431.00	1475.00	1476.8	1463.19	12051970	1.763438e+15	197146.0	7196647.0	0.5971	1506.932	1318.50425	4855323.0	0.026482	1.47
55	1461.00	1471.65	1472.5	1481.15	12039276	1.783196e+15	252296.0	4818551.0	0.4002	1505.016	1320.34575	7220725.0	-0.002912	1.46
30	1407.50	1412.90	1412.3	1421.13	17616451	2.503529e+15	447876.0	8982938.0	0.5099	1502.438	1322.02125	8633513.0	-0.040883	1.40

In [ ]:
```
# If you have invested 1000rs it would have become 1400rs in one year
```