Here we will be using time series analysis for basic calculation such as moving averages etc

In [1]:

```
import pandas as pd
import numpy as np
from pandas import datetime
from matplotlib import pyplot as plt
%matplotlib inline
import seaborn as sns
```

In [2]:

```
# setting figure size
from matplotlib.pylab import rcParams
rcParams['figure.figsize'] = 20,10
#for normalizing data
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler(feature_range=(0, 1))
```

In [3]:

```
nifty = pd.read_csv("nifty_it_index.csv")

tcs = pd.read_csv("tcs_stock.csv")

infy = pd.read_csv("infy_stock.csv")
```

In [4]:

```
nifty.head(10)
```

Out[4]:

	Date	Open	High	Low	Close	Volume	Turnover
0	2015-01-01	11214.80	11235.75	11166.35	11215.70	4246150	3.575100e+09
1	2015-01-02	11214.65	11399.10	11214.65	11372.10	10004862	9.645600e+09
2	2015-01-05	11369.35	11433.75	11186.95	11248.55	8858018	1.059000e+10
3	2015-01-06	11186.10	11186.10	10909.00	10959.90	12515739	1.364500e+10
4	2015-01-07	11013.20	11042.35	10889.55	10916.00	10976356	1.203440e+10
5	2015-01-08	11031.15	11058.15	10915.05	11018.15	12975117	1.485630e+10
6	2015-01-09	11058.05	11484.90	10932.20	11399.65	24812224	3.536420e+10
7	2015-01-12	11456.00	11565.85	11378.80	11543.65	16505074	1.712310e+10
8	2015-01-13	11545.25	11546.60	11437.95	11502.80	12511358	1.417510e+10
9	2015-01-14	11561.95	11631.55	11521.00	11614.30	12544558	1.438530e+10

In [5]:

```
tcs.head(10)
```

Out[5]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP
0	2015-01-01	TCS	EQ	2558.25	2567.0	2567.00	2541.00	2550.00	2545.55	2548.51
1	2015-01-02	TCS	EQ	2545.55	2551.0	2590.95	2550.60	2588.40	2579.45	2568.19
2	2015-01-05	TCS	EQ	2579.45	2581.0	2599.90	2524.65	2538.10	2540.25	2563.94
3	2015-01-06	TCS	EQ	2540.25	2529.1	2529.10	2440.00	2450.05	2446.60	2466.90
4	2015-01-07	TCS	EQ	2446.60	2470.0	2479.15	2407.45	2426.90	2417.70	2433.96
5	2015-01-08	TCS	EQ	2417.70	2442.4	2449.00	2420.55	2446.00	2443.80	2434.81
6	2015-01-09	TCS	EQ	2443.80	2455.0	2519.90	2450.00	2510.00	2512.30	2490.01
7	2015-01-12	TCS	EQ	2512.30	2517.0	2528.00	2480.25	2527.95	2509.70	2497.82
8	2015-01-13	TCS	EQ	2509.70	2520.0	2530.40	2480.10	2498.00	2497.90	2509.40
9	2015-01-14	TCS	EQ	2497.90	2516.0	2531.80	2500.50	2525.05	2521.95	2517.54

In [6]:

```
infy.head(10)
```

Out[6]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWA
0	2015-01-01	INFY	EQ	1972.55	1968.95	1982.00	1956.90	1971.00	1974.40	1971.3
1	2015-01-02	INFY	EQ	1974.40	1972.00	2019.05	1972.00	2017.95	2013.20	2003.2
2	2015-01-05	INFY	EQ	2013.20	2009.90	2030.00	1977.50	1996.00	1995.90	2004.5
3	2015-01-06	INFY	EQ	1995.90	1980.00	1985.00	1934.10	1965.10	1954.20	1954.8
4	2015-01-07	INFY	EQ	1954.20	1965.00	1974.75	1950.00	1966.05	1963.55	1962.5
5	2015-01-08	INFY	EQ	1963.55	1985.60	1997.00	1950.00	1979.25	1973.45	1972.7
6	2015-01-09	INFY	EQ	1973.45	1980.10	2109.00	1913.05	2075.30	2074.45	2037.6
7	2015-01-12	INFY	EQ	2074.45	2092.00	2119.20	2075.00	2112.95	2115.95	2099.4
8	2015-01-13	INFY	EQ	2115.95	2107.80	2107.80	2075.00	2092.00	2088.90	2089.4
9	2015-01-14	INFY	EQ	2088.90	2098.50	2133.00	2092.60	2129.00	2128.65	2110.8

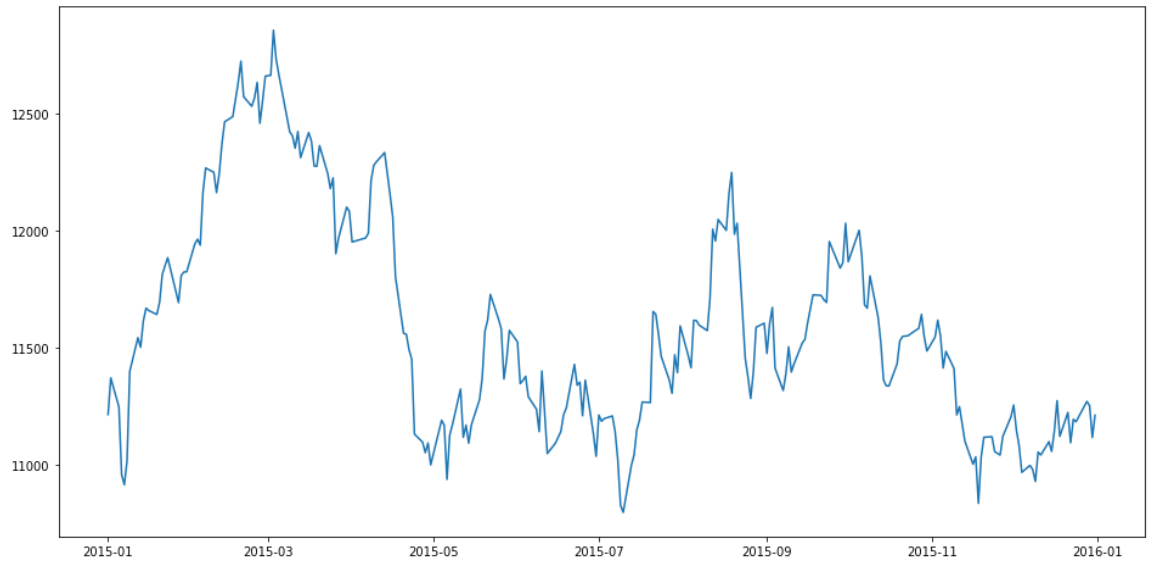
In [8]:

```
# setting the index as date
nifty['Date'] = pd.to_datetime(nifty.Date , format = '%Y-%m-%d')
nifty.index = nifty['Date']

# plotting
plt.figure(figsize=(16,8))
plt.plot(nifty['Close'], label='Close Price Plotting')
```

Out[8]:

```
[<matplotlib.lines.Line2D at 0x14b8e668>]
```



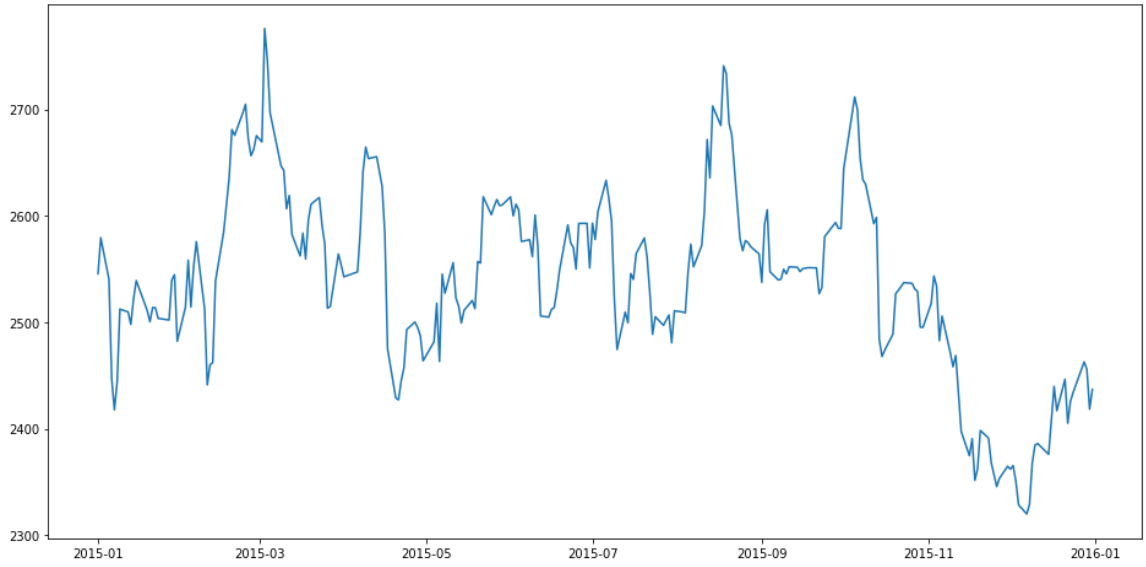
In [9]:

```
# setting the index as date
tcs['Date'] = pd.to_datetime(tcs.Date , format = '%Y-%m-%d')
tcs.index = tcs['Date']

# plotting
plt.figure(figsize=(16,8))
plt.plot(tcs['Close'], label='Close Price Plotting')
```

Out[9]:

```
[<matplotlib.lines.Line2D at 0x14d80ba8>]
```



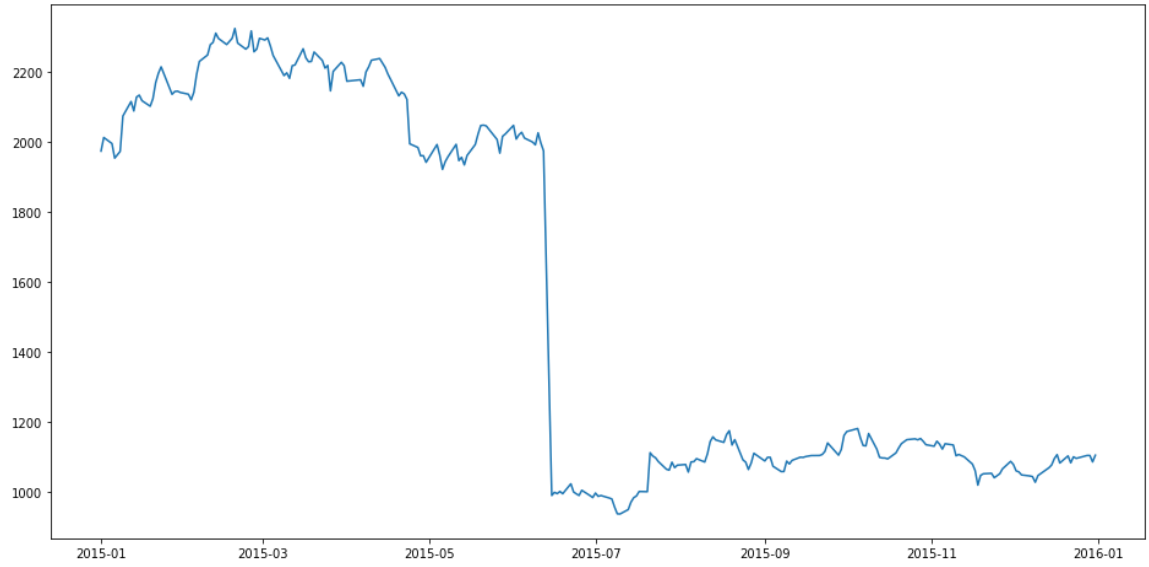
In [10]:

```
# setting the index as date
infy['Date'] = pd.to_datetime(infy.Date , format = '%Y-%m-%d')
infy.index = infy['Date']

# plotting
plt.figure(figsize=(16,8))
plt.plot(infy['Close'], label='Close Price Plotting')
```

Out[10]:

```
[<matplotlib.lines.Line2D at 0x14eedc88>]
```



In [15]:

```
## Moving averages
weeks = [4 , 16 , 28 , 40 , 52]

# As they are given in weeks we need to resample them as per the requirement

dummy = pd.DataFrame()

dummy['Close'] = nifty['Close'].resample('W').mean()

# Moving Averages using inbuilt function:
for i in range(len(weeks)):

    moving_avg = dummy['Close'].rolling(weeks[i]).mean()
    dummy[" Moving_Averages for " + str(weeks[i])+ " Weeks"] = moving_avg
    print('Following Moving Averages: for {0} weeks: \n\n {1}' .format(weeks[i], dummy[
'Close']))
    dummy.plot(title="Moving Averages for nifty")
```

```
Following Moving Averages: for 4 weeks:

 Date
2015-01-04    11293.9000
2015-01-11    11108.4500
2015-01-18    11598.0400
2015-01-25    11777.4900
2015-02-01    11787.9750
2015-02-08    12055.9700
2015-02-15    12298.5000
2015-02-22    12603.9250
2015-03-01    12567.3500
2015-03-08    12728.9250
2015-03-15    12383.0900
2015-03-22    12343.4000
2015-03-29    12104.1300
2015-04-05    12045.3500
2015-04-12    12149.4100
2015-04-19    12087.6000
2015-04-26    11439.2800
2015-05-03    11061.5750
2015-05-10    11120.0700
2015-05-17    11175.8000
2015-05-24    11514.0700
2015-05-31    11519.7300
2015-06-07    11381.0800
2015-06-14    11211.9500
2015-06-21    11163.1100
2015-06-28    11339.5300
2015-07-05    11154.1100
2015-07-12    11000.4400
2015-07-19    11130.7500
2015-07-26    11517.8000
2015-08-02    11425.6200
2015-08-09    11542.7000
2015-08-16    11859.2800
2015-08-23    12085.5600
2015-08-30    11420.2300
2015-09-06    11554.6600
2015-09-13    11408.5000
2015-09-20    11597.5000
2015-09-27    11769.4250
2015-10-04    11901.2375
2015-10-11    11810.5400
2015-10-18    11438.4600
2015-10-25    11515.7000
2015-11-01    11567.6500
2015-11-08    11523.2300
2015-11-15    11244.6250
2015-11-22    11005.4700
2015-11-29    11086.1000
2015-12-06    11132.5700
2015-12-13    11001.8200
2015-12-20    11140.1000
2015-12-27    11175.1875
2016-01-03    11213.8500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 16 weeks:

 Date
2015-01-04    11293.9000
```

```
2015-01-11    11108.4500
2015-01-18    11598.0400
2015-01-25    11777.4900
2015-02-01    11787.9750
2015-02-08    12055.9700
2015-02-15    12298.5000
2015-02-22    12603.9250
2015-03-01    12567.3500
2015-03-08    12728.9250
2015-03-15    12383.0900
2015-03-22    12343.4000
2015-03-29    12104.1300
2015-04-05    12045.3500
2015-04-12    12149.4100
2015-04-19    12087.6000
2015-04-26    11439.2800
2015-05-03    11061.5750
2015-05-10    11120.0700
2015-05-17    11175.8000
2015-05-24    11514.0700
2015-05-31    11519.7300
2015-06-07    11381.0800
2015-06-14    11211.9500
2015-06-21    11163.1100
2015-06-28    11339.5300
2015-07-05    11154.1100
2015-07-12    11000.4400
2015-07-19    11130.7500
2015-07-26    11517.8000
2015-08-02    11425.6200
2015-08-09    11542.7000
2015-08-16    11859.2800
2015-08-23    12085.5600
2015-08-30    11420.2300
2015-09-06    11554.6600
2015-09-13    11408.5000
2015-09-20    11597.5000
2015-09-27    11769.4250
2015-10-04    11901.2375
2015-10-11    11810.5400
2015-10-18    11438.4600
2015-10-25    11515.7000
2015-11-01    11567.6500
2015-11-08    11523.2300
2015-11-15    11244.6250
2015-11-22    11005.4700
2015-11-29    11086.1000
2015-12-06    11132.5700
2015-12-13    11001.8200
2015-12-20    11140.1000
2015-12-27    11175.1875
2016-01-03    11213.8500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 28 weeks:

 Date
2015-01-04    11293.9000
2015-01-11    11108.4500
2015-01-18    11598.0400
2015-01-25    11777.4900
2015-02-01    11787.9750
```

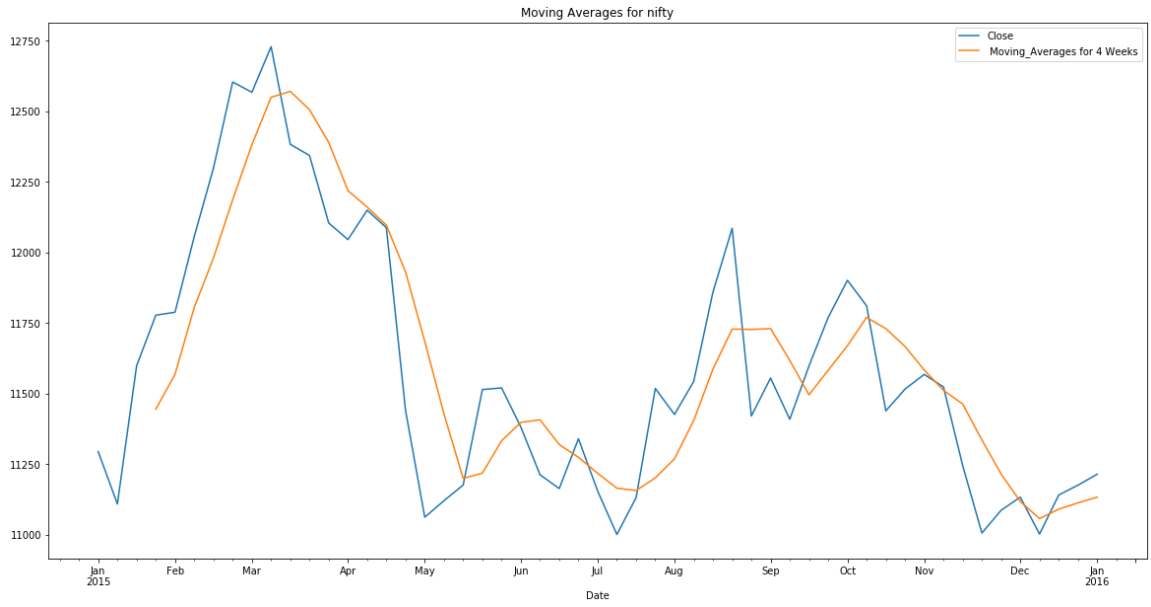
```
2015-02-08    12055.9700
2015-02-15    12298.5000
2015-02-22    12603.9250
2015-03-01    12567.3500
2015-03-08    12728.9250
2015-03-15    12383.0900
2015-03-22    12343.4000
2015-03-29    12104.1300
2015-04-05    12045.3500
2015-04-12    12149.4100
2015-04-19    12087.6000
2015-04-26    11439.2800
2015-05-03    11061.5750
2015-05-10    11120.0700
2015-05-17    11175.8000
2015-05-24    11514.0700
2015-05-31    11519.7300
2015-06-07    11381.0800
2015-06-14    11211.9500
2015-06-21    11163.1100
2015-06-28    11339.5300
2015-07-05    11154.1100
2015-07-12    11000.4400
2015-07-19    11130.7500
2015-07-26    11517.8000
2015-08-02    11425.6200
2015-08-09    11542.7000
2015-08-16    11859.2800
2015-08-23    12085.5600
2015-08-30    11420.2300
2015-09-06    11554.6600
2015-09-13    11408.5000
2015-09-20    11597.5000
2015-09-27    11769.4250
2015-10-04    11901.2375
2015-10-11    11810.5400
2015-10-18    11438.4600
2015-10-25    11515.7000
2015-11-01    11567.6500
2015-11-08    11523.2300
2015-11-15    11244.6250
2015-11-22    11005.4700
2015-11-29    11086.1000
2015-12-06    11132.5700
2015-12-13    11001.8200
2015-12-20    11140.1000
2015-12-27    11175.1875
2016-01-03    11213.8500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 40 weeks:

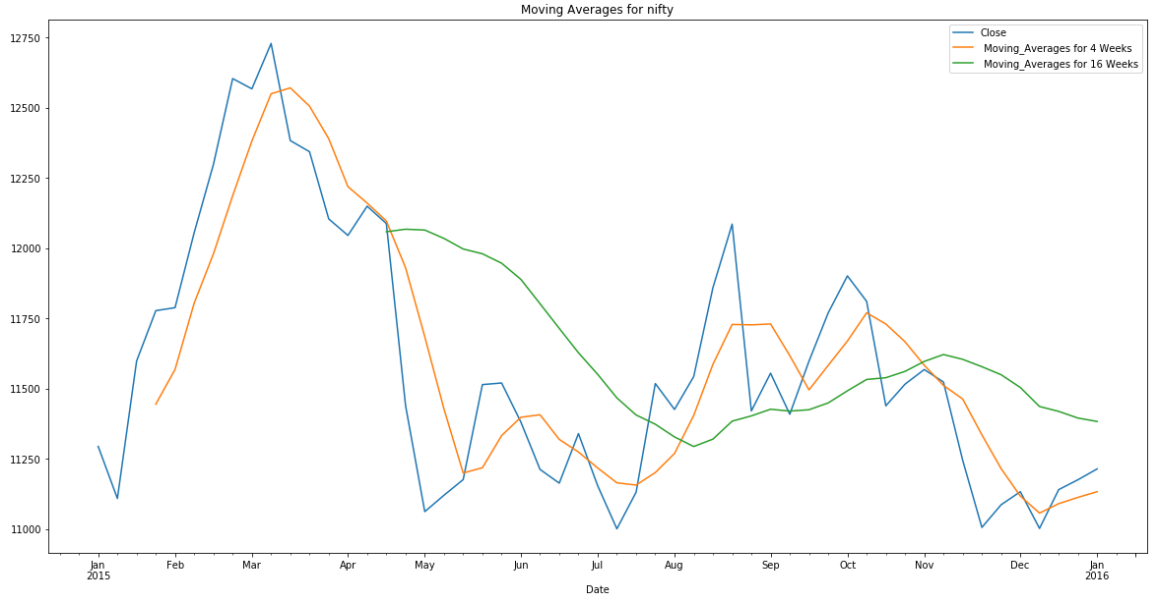
 Date
2015-01-04    11293.9000
2015-01-11    11108.4500
2015-01-18    11598.0400
2015-01-25    11777.4900
2015-02-01    11787.9750
2015-02-08    12055.9700
2015-02-15    12298.5000
2015-02-22    12603.9250
2015-03-01    12567.3500
```

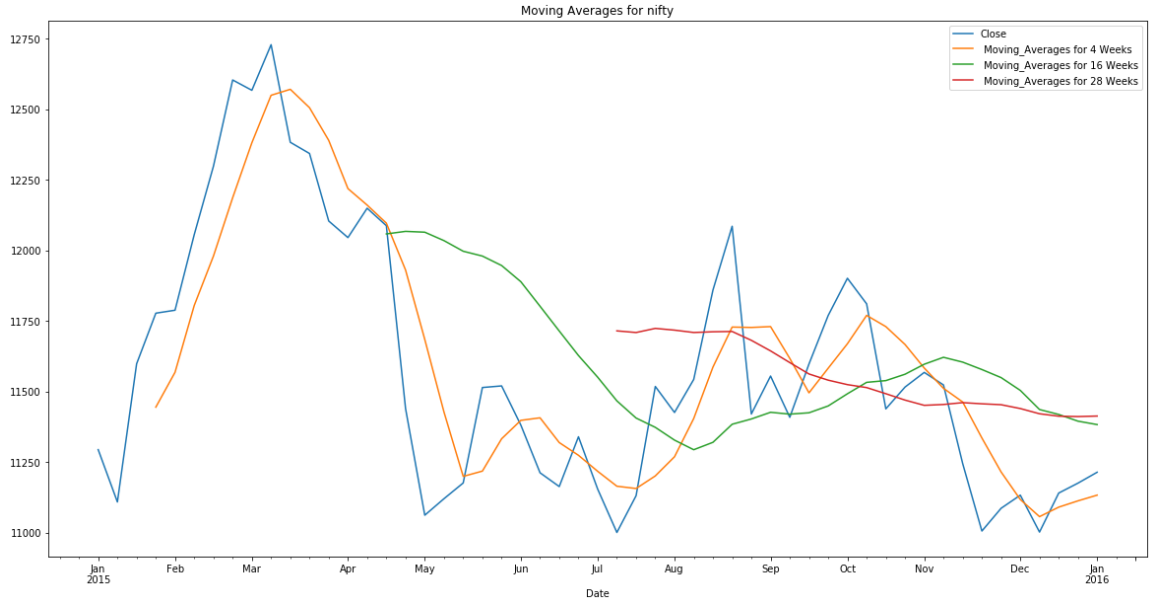
```
2015-03-08    12728.9250
2015-03-15    12383.0900
2015-03-22    12343.4000
2015-03-29    12104.1300
2015-04-05    12045.3500
2015-04-12    12149.4100
2015-04-19    12087.6000
2015-04-26    11439.2800
2015-05-03    11061.5750
2015-05-10    11120.0700
2015-05-17    11175.8000
2015-05-24    11514.0700
2015-05-31    11519.7300
2015-06-07    11381.0800
2015-06-14    11211.9500
2015-06-21    11163.1100
2015-06-28    11339.5300
2015-07-05    11154.1100
2015-07-12    11000.4400
2015-07-19    11130.7500
2015-07-26    11517.8000
2015-08-02    11425.6200
2015-08-09    11542.7000
2015-08-16    11859.2800
2015-08-23    12085.5600
2015-08-30    11420.2300
2015-09-06    11554.6600
2015-09-13    11408.5000
2015-09-20    11597.5000
2015-09-27    11769.4250
2015-10-04    11901.2375
2015-10-11    11810.5400
2015-10-18    11438.4600
2015-10-25    11515.7000
2015-11-01    11567.6500
2015-11-08    11523.2300
2015-11-15    11244.6250
2015-11-22    11005.4700
2015-11-29    11086.1000
2015-12-06    11132.5700
2015-12-13    11001.8200
2015-12-20    11140.1000
2015-12-27    11175.1875
2016-01-03    11213.8500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 52 weeks:

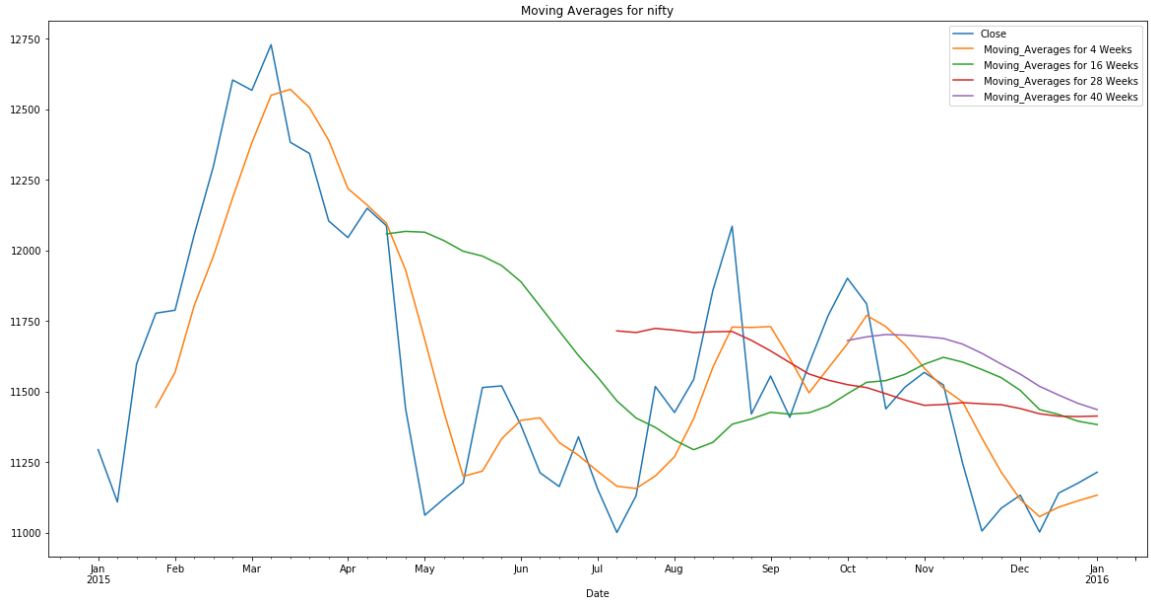
 Date
2015-01-04    11293.9000
2015-01-11    11108.4500
2015-01-18    11598.0400
2015-01-25    11777.4900
2015-02-01    11787.9750
2015-02-08    12055.9700
2015-02-15    12298.5000
2015-02-22    12603.9250
2015-03-01    12567.3500
2015-03-08    12728.9250
2015-03-15    12383.0900
2015-03-22    12343.4000
2015-03-29    12104.1300
```

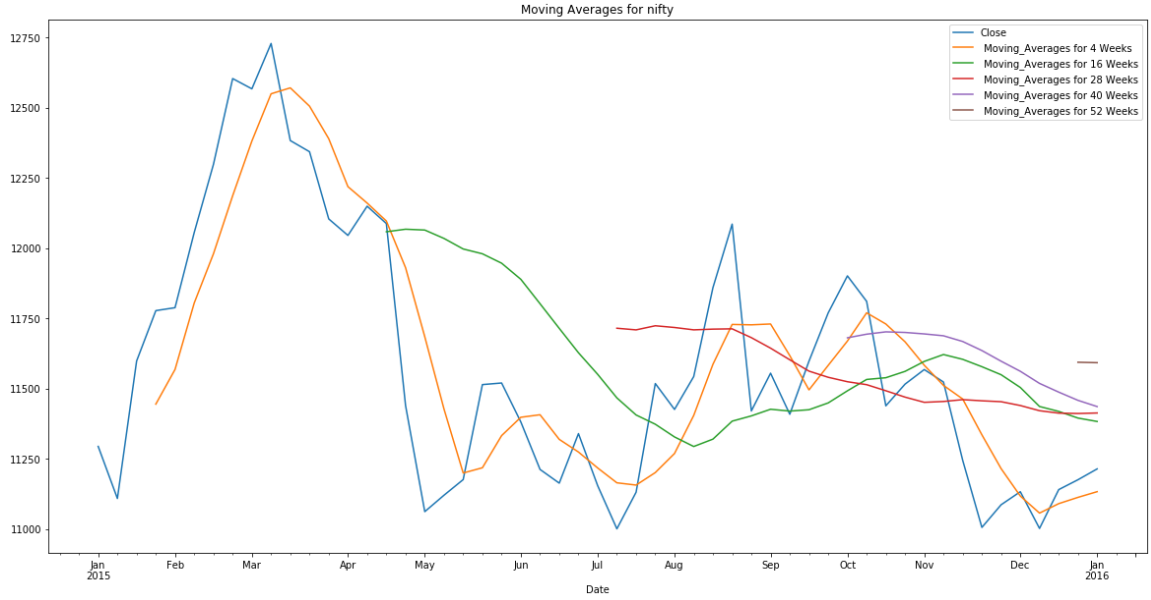
```
2015-04-05    12045.3500
2015-04-12    12149.4100
2015-04-19    12087.6000
2015-04-26    11439.2800
2015-05-03    11061.5750
2015-05-10    11120.0700
2015-05-17    11175.8000
2015-05-24    11514.0700
2015-05-31    11519.7300
2015-06-07    11381.0800
2015-06-14    11211.9500
2015-06-21    11163.1100
2015-06-28    11339.5300
2015-07-05    11154.1100
2015-07-12    11000.4400
2015-07-19    11130.7500
2015-07-26    11517.8000
2015-08-02    11425.6200
2015-08-09    11542.7000
2015-08-16    11859.2800
2015-08-23    12085.5600
2015-08-30    11420.2300
2015-09-06    11554.6600
2015-09-13    11408.5000
2015-09-20    11597.5000
2015-09-27    11769.4250
2015-10-04    11901.2375
2015-10-11    11810.5400
2015-10-18    11438.4600
2015-10-25    11515.7000
2015-11-01    11567.6500
2015-11-08    11523.2300
2015-11-15    11244.6250
2015-11-22    11005.4700
2015-11-29    11086.1000
2015-12-06    11132.5700
2015-12-13    11001.8200
2015-12-20    11140.1000
2015-12-27    11175.1875
2016-01-03    11213.8500
Freq: W-SUN, Name: Close, dtype: float64
```




Moving Averages for nifty
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
12750
12500
12250
12000
11750
11500
11250
11000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for nifty
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
12750
12500
12250
12000
11750
11500
11250
11000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for nifty
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
12750
12500
12250
12000
11750
11500
11250
11000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for nifty
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
Moving_Averages for 52 Weeks
12750
12500
12250
12000
11750
11500
11250
11000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date

In [16]:

```
## Moving averages
weeks = [4 , 16 , 28 , 40 , 52]

# As they are given in weeks we need to resample them as per the requirement

dummy = pd.DataFrame()

dummy['Close'] = tcs['Close'].resample('W').mean()

# Moving Averages using inbuilt function:
for i in range(len(weeks)):

    moving_avg = dummy['Close'].rolling(weeks[i]).mean()
    dummy[" Moving_Averages for " + str(weeks[i])+ " Weeks"] = moving_avg
    print('Following Moving Averages: for {0} weeks: \n\n {1}' .format(weeks[i], dummy[
'Close']))
    dummy.plot(title="Moving Averages for tcs")
```

```
Following Moving Averages: for 4 weeks:

 Date
2015-01-04    2562.500000
2015-01-11    2472.130000
2015-01-18    2520.160000
2015-01-25    2508.480000
2015-02-01    2517.087500
2015-02-08    2542.980000
2015-02-15    2482.970000
2015-02-22    2644.262500
2015-03-01    2677.941667
2015-03-08    2721.962500
2015-03-15    2619.490000
2015-03-22    2582.510000
2015-03-29    2562.020000
2015-04-05    2553.583333
2015-04-12    2618.400000
2015-04-19    2585.225000
2015-04-26    2450.250000
2015-05-03    2486.550000
2015-05-10    2506.990000
2015-05-17    2520.940000
2015-05-24    2552.710000
2015-05-31    2608.980000
2015-06-07    2602.010000
2015-06-14    2563.390000
2015-06-21    2522.040000
2015-06-28    2575.840000
2015-07-05    2583.720000
2015-07-12    2568.300000
2015-07-19    2531.880000
2015-07-26    2532.470000
2015-08-02    2499.450000
2015-08-09    2538.200000
2015-08-16    2637.360000
2015-08-23    2704.450000
2015-08-30    2573.610000
2015-09-06    2569.260000
2015-09-13    2545.440000
2015-09-20    2550.212500
2015-09-27    2547.725000
2015-10-04    2603.650000
2015-10-11    2665.810000
2015-10-18    2523.270000
2015-10-25    2520.662500
2015-11-01    2517.460000
2015-11-08    2516.600000
2015-11-15    2448.925000
2015-11-22    2375.500000
2015-11-29    2364.475000
2015-12-06    2354.190000
2015-12-13    2357.400000
2015-12-20    2403.850000
2015-12-27    2427.875000
2016-01-03    2443.412500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 16 weeks:

 Date
2015-01-04    2562.500000
```

```
2015-01-11    2472.130000
2015-01-18    2520.160000
2015-01-25    2508.480000
2015-02-01    2517.087500
2015-02-08    2542.980000
2015-02-15    2482.970000
2015-02-22    2644.262500
2015-03-01    2677.941667
2015-03-08    2721.962500
2015-03-15    2619.490000
2015-03-22    2582.510000
2015-03-29    2562.020000
2015-04-05    2553.583333
2015-04-12    2618.400000
2015-04-19    2585.225000
2015-04-26    2450.250000
2015-05-03    2486.550000
2015-05-10    2506.990000
2015-05-17    2520.940000
2015-05-24    2552.710000
2015-05-31    2608.980000
2015-06-07    2602.010000
2015-06-14    2563.390000
2015-06-21    2522.040000
2015-06-28    2575.840000
2015-07-05    2583.720000
2015-07-12    2568.300000
2015-07-19    2531.880000
2015-07-26    2532.470000
2015-08-02    2499.450000
2015-08-09    2538.200000
2015-08-16    2637.360000
2015-08-23    2704.450000
2015-08-30    2573.610000
2015-09-06    2569.260000
2015-09-13    2545.440000
2015-09-20    2550.212500
2015-09-27    2547.725000
2015-10-04    2603.650000
2015-10-11    2665.810000
2015-10-18    2523.270000
2015-10-25    2520.662500
2015-11-01    2517.460000
2015-11-08    2516.600000
2015-11-15    2448.925000
2015-11-22    2375.500000
2015-11-29    2364.475000
2015-12-06    2354.190000
2015-12-13    2357.400000
2015-12-20    2403.850000
2015-12-27    2427.875000
2016-01-03    2443.412500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 28 weeks:

 Date
2015-01-04    2562.500000
2015-01-11    2472.130000
2015-01-18    2520.160000
2015-01-25    2508.480000
2015-02-01    2517.087500
```

```
2015-02-08    2542.980000
2015-02-15    2482.970000
2015-02-22    2644.262500
2015-03-01    2677.941667
2015-03-08    2721.962500
2015-03-15    2619.490000
2015-03-22    2582.510000
2015-03-29    2562.020000
2015-04-05    2553.583333
2015-04-12    2618.400000
2015-04-19    2585.225000
2015-04-26    2450.250000
2015-05-03    2486.550000
2015-05-10    2506.990000
2015-05-17    2520.940000
2015-05-24    2552.710000
2015-05-31    2608.980000
2015-06-07    2602.010000
2015-06-14    2563.390000
2015-06-21    2522.040000
2015-06-28    2575.840000
2015-07-05    2583.720000
2015-07-12    2568.300000
2015-07-19    2531.880000
2015-07-26    2532.470000
2015-08-02    2499.450000
2015-08-09    2538.200000
2015-08-16    2637.360000
2015-08-23    2704.450000
2015-08-30    2573.610000
2015-09-06    2569.260000
2015-09-13    2545.440000
2015-09-20    2550.212500
2015-09-27    2547.725000
2015-10-04    2603.650000
2015-10-11    2665.810000
2015-10-18    2523.270000
2015-10-25    2520.662500
2015-11-01    2517.460000
2015-11-08    2516.600000
2015-11-15    2448.925000
2015-11-22    2375.500000
2015-11-29    2364.475000
2015-12-06    2354.190000
2015-12-13    2357.400000
2015-12-20    2403.850000
2015-12-27    2427.875000
2016-01-03    2443.412500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 40 weeks:

 Date
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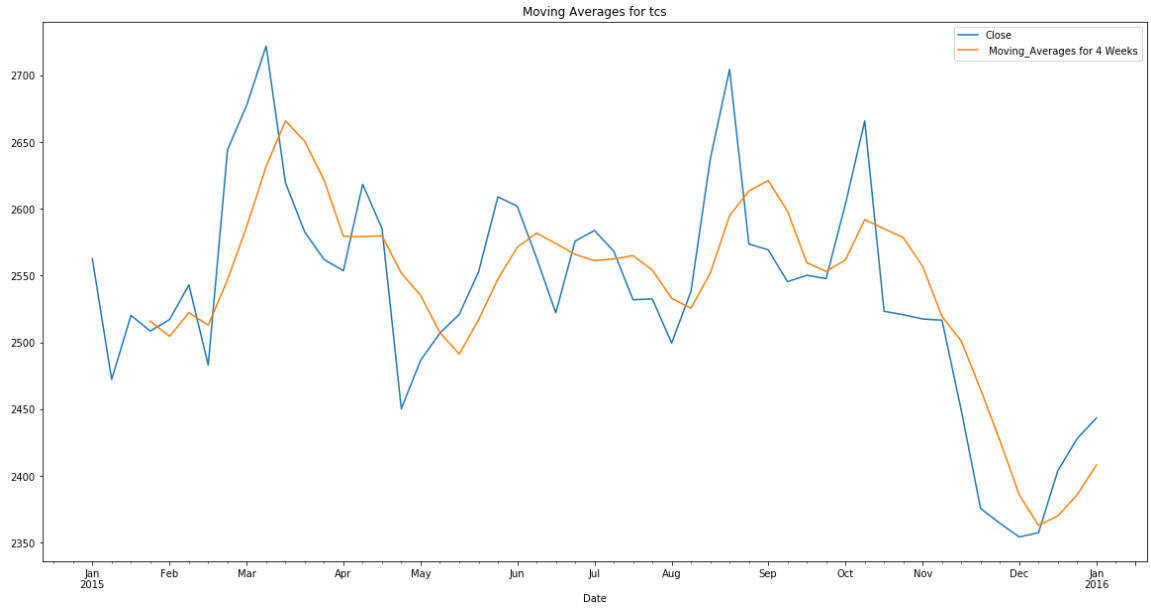
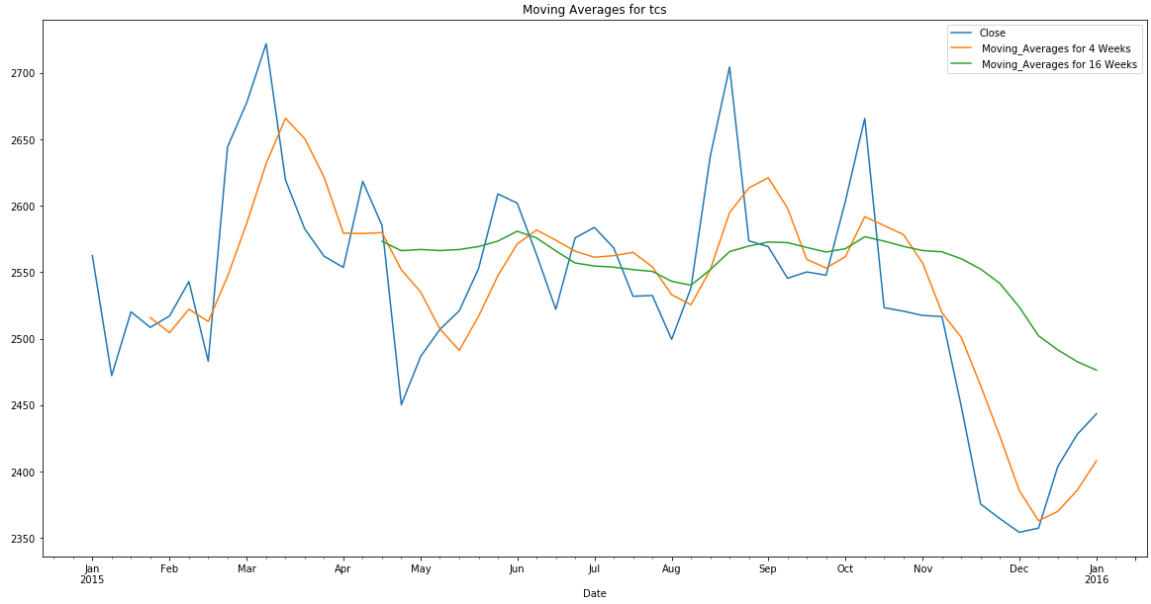
2015-01-11    2472.130000
2015-01-18    2520.160000
2015-01-25    2508.480000
2015-02-01    2517.087500
2015-02-08    2542.980000
2015-02-15    2482.970000
2015-02-22    2644.262500
2015-03-01    2677.941667
```

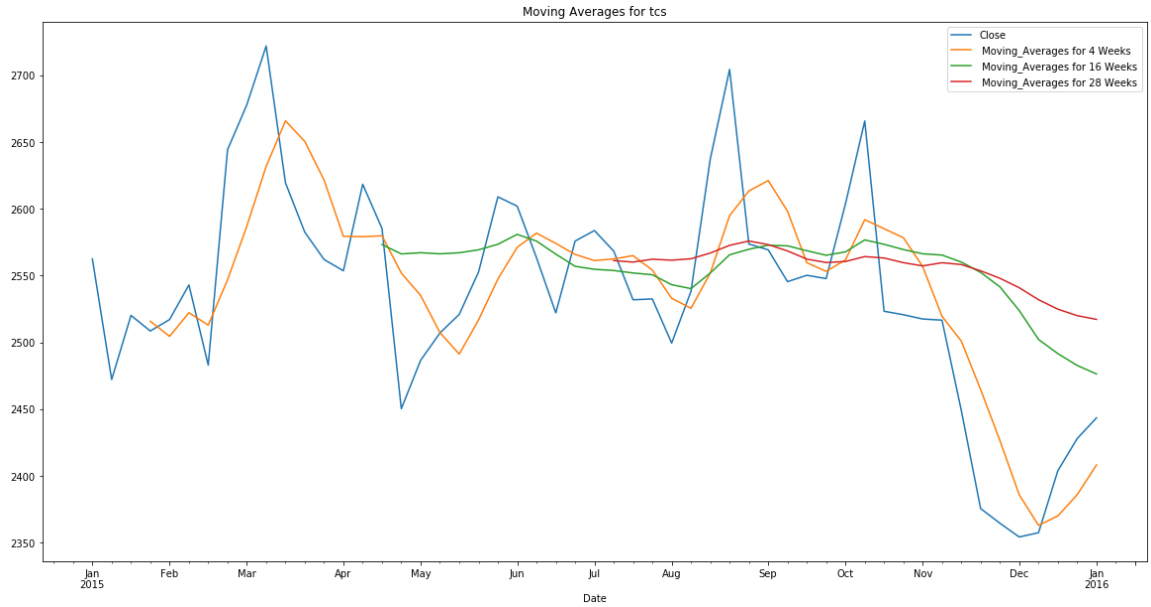
```
2015-03-08    2721.962500
2015-03-15    2619.490000
2015-03-22    2582.510000
2015-03-29    2562.020000
2015-04-05    2553.583333
2015-04-12    2618.400000
2015-04-19    2585.225000
2015-04-26    2450.250000
2015-05-03    2486.550000
2015-05-10    2506.990000
2015-05-17    2520.940000
2015-05-24    2552.710000
2015-05-31    2608.980000
2015-06-07    2602.010000
2015-06-14    2563.390000
2015-06-21    2522.040000
2015-06-28    2575.840000
2015-07-05    2583.720000
2015-07-12    2568.300000
2015-07-19    2531.880000
2015-07-26    2532.470000
2015-08-02    2499.450000
2015-08-09    2538.200000
2015-08-16    2637.360000
2015-08-23    2704.450000
2015-08-30    2573.610000
2015-09-06    2569.260000
2015-09-13    2545.440000
2015-09-20    2550.212500
2015-09-27    2547.725000
2015-10-04    2603.650000
2015-10-11    2665.810000
2015-10-18    2523.270000
2015-10-25    2520.662500
2015-11-01    2517.460000
2015-11-08    2516.600000
2015-11-15    2448.925000
2015-11-22    2375.500000
2015-11-29    2364.475000
2015-12-06    2354.190000
2015-12-13    2357.400000
2015-12-20    2403.850000
2015-12-27    2427.875000
2016-01-03    2443.412500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 52 weeks:

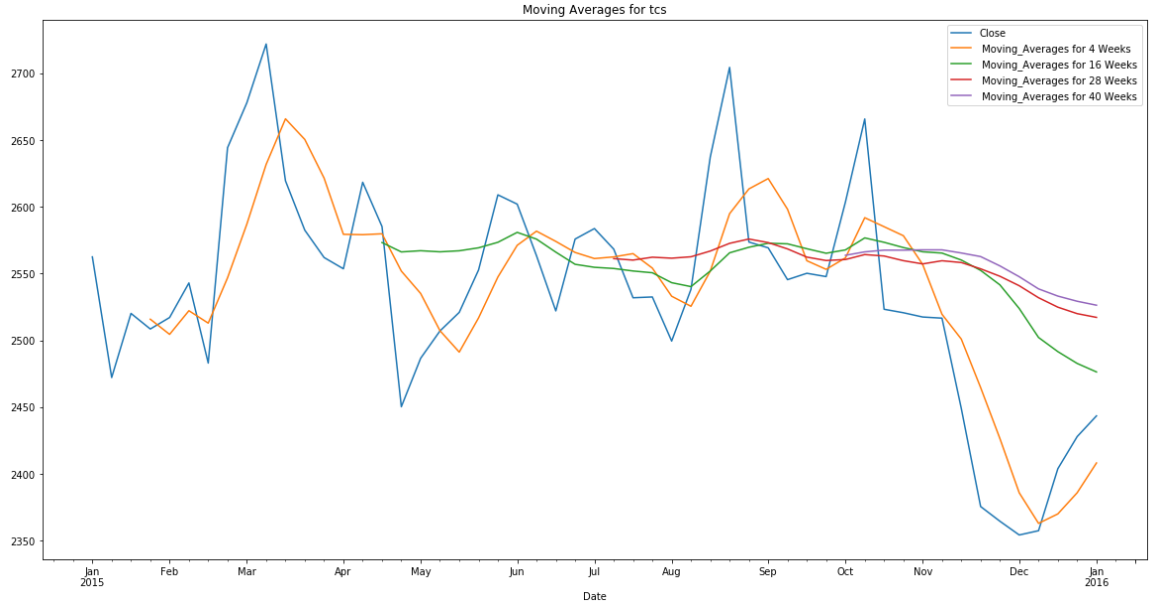
 Date
2015-01-04    2562.500000
2015-01-11    2472.130000
2015-01-18    2520.160000
2015-01-25    2508.480000
2015-02-01    2517.087500
2015-02-08    2542.980000
2015-02-15    2482.970000
2015-02-22    2644.262500
2015-03-01    2677.941667
2015-03-08    2721.962500
2015-03-15    2619.490000
2015-03-22    2582.510000
2015-03-29    2562.020000
```

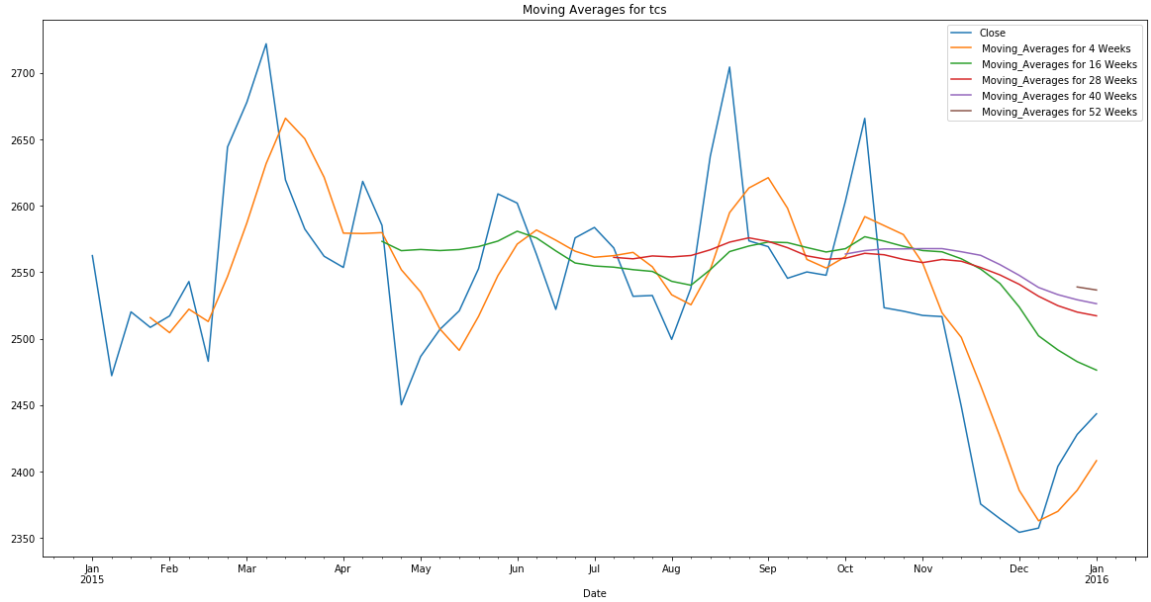
```
2015-04-05    2553.583333
2015-04-12    2618.400000
2015-04-19    2585.225000
2015-04-26    2450.250000
2015-05-03    2486.550000
2015-05-10    2506.990000
2015-05-17    2520.940000
2015-05-24    2552.710000
2015-05-31    2608.980000
2015-06-07    2602.010000
2015-06-14    2563.390000
2015-06-21    2522.040000
2015-06-28    2575.840000
2015-07-05    2583.720000
2015-07-12    2568.300000
2015-07-19    2531.880000
2015-07-26    2532.470000
2015-08-02    2499.450000
2015-08-09    2538.200000
2015-08-16    2637.360000
2015-08-23    2704.450000
2015-08-30    2573.610000
2015-09-06    2569.260000
2015-09-13    2545.440000
2015-09-20    2550.212500
2015-09-27    2547.725000
2015-10-04    2603.650000
2015-10-11    2665.810000
2015-10-18    2523.270000
2015-10-25    2520.662500
2015-11-01    2517.460000
2015-11-08    2516.600000
2015-11-15    2448.925000
2015-11-22    2375.500000
2015-11-29    2364.475000
2015-12-06    2354.190000
2015-12-13    2357.400000
2015-12-20    2403.850000
2015-12-27    2427.875000
2016-01-03    2443.412500
Freq: W-SUN, Name: Close, dtype: float64
```




Moving Averages for tcs
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
2700
2650
2600
2550
2500
2450
2400
2350
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for tcs
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
2700
2650
2600
2550
2500
2450
2400
2350
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for tcs
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
2700
2650
2600
2550
2500
2450
2400
2350
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for tcs
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
Moving_Averages for 52 Weeks
2700
2650
2600
2550
2500
2450
2400
2350
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date

In [17]:

```
## Moving averages
weeks = [4 , 16 , 28 , 40 , 52]

# As they are given in weeks we need to resample them as per the requirement

dummy = pd.DataFrame()

dummy['Close'] = infy['Close'].resample('W').mean()

# Moving Averages using inbuilt function:
for i in range(len(weeks)):

    moving_avg = dummy['Close'].rolling(weeks[i]).mean()
    dummy[" Moving_Averages for " + str(weeks[i])+ " Weeks"] = moving_avg
    print('Following Moving Averages: for {0} weeks: \n\n {1}' .format(weeks[i], dummy[
'Close']))
    dummy.plot(title="Moving Averages for infy")
```

```
Following Moving Averages: for 4 weeks:

 Date
2015-01-04    1993.800000
2015-01-11    1992.310000
2015-01-18    2117.210000
2015-01-25    2161.620000
2015-02-01    2142.112500
2015-02-08    2164.980000
2015-02-15    2283.870000
2015-02-22    2295.762500
2015-03-01    2279.383333
2015-03-08    2277.950000
2015-03-15    2201.790000
2015-03-22    2244.910000
2015-03-29    2202.500000
2015-04-05    2206.766667
2015-04-12    2197.440000
2015-04-19    2206.600000
2015-04-26    2105.930000
2015-05-03    1962.237500
2015-05-10    1955.970000
2015-05-17    1958.800000
2015-05-24    2031.520000
2015-05-31    2006.470000
2015-06-07    2023.410000
2015-06-14    1998.270000
2015-06-21     996.560000
2015-06-28    1003.010000
2015-07-05     990.040000
2015-07-12     959.360000
2015-07-19     979.260000
2015-07-26    1080.530000
2015-08-02    1072.120000
2015-08-09    1081.020000
2015-08-16    1129.360000
2015-08-23    1153.300000
2015-08-30    1087.230000
2015-09-06    1091.230000
2015-09-13    1075.490000
2015-09-20    1101.262500
2015-09-27    1117.225000
2015-10-04    1140.600000
2015-10-11    1153.820000
2015-10-18    1102.430000
2015-10-25    1131.550000
2015-11-01    1147.050000
2015-11-08    1134.940000
2015-11-15    1111.712500
2015-11-22    1052.380000
2015-11-29    1053.400000
2015-12-06    1066.880000
2015-12-13    1043.800000
2015-12-20    1086.630000
2015-12-27    1096.100000
2016-01-03    1100.287500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 16 weeks:

 Date
2015-01-04    1993.800000
```

```
2015-01-11    1992.310000
2015-01-18    2117.210000
2015-01-25    2161.620000
2015-02-01    2142.112500
2015-02-08    2164.980000
2015-02-15    2283.870000
2015-02-22    2295.762500
2015-03-01    2279.383333
2015-03-08    2277.950000
2015-03-15    2201.790000
2015-03-22    2244.910000
2015-03-29    2202.500000
2015-04-05    2206.766667
2015-04-12    2197.440000
2015-04-19    2206.600000
2015-04-26    2105.930000
2015-05-03    1962.237500
2015-05-10    1955.970000
2015-05-17    1958.800000
2015-05-24    2031.520000
2015-05-31    2006.470000
2015-06-07    2023.410000
2015-06-14    1998.270000
2015-06-21     996.560000
2015-06-28    1003.010000
2015-07-05     990.040000
2015-07-12     959.360000
2015-07-19     979.260000
2015-07-26    1080.530000
2015-08-02    1072.120000
2015-08-09    1081.020000
2015-08-16    1129.360000
2015-08-23    1153.300000
2015-08-30    1087.230000
2015-09-06    1091.230000
2015-09-13    1075.490000
2015-09-20    1101.262500
2015-09-27    1117.225000
2015-10-04    1140.600000
2015-10-11    1153.820000
2015-10-18    1102.430000
2015-10-25    1131.550000
2015-11-01    1147.050000
2015-11-08    1134.940000
2015-11-15    1111.712500
2015-11-22    1052.380000
2015-11-29    1053.400000
2015-12-06    1066.880000
2015-12-13    1043.800000
2015-12-20    1086.630000
2015-12-27    1096.100000
2016-01-03    1100.287500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 28 weeks:

 Date
2015-01-04    1993.800000
2015-01-11    1992.310000
2015-01-18    2117.210000
2015-01-25    2161.620000
2015-02-01    2142.112500
```

```
2015-02-08    2164.980000
2015-02-15    2283.870000
2015-02-22    2295.762500
2015-03-01    2279.383333
2015-03-08    2277.950000
2015-03-15    2201.790000
2015-03-22    2244.910000
2015-03-29    2202.500000
2015-04-05    2206.766667
2015-04-12    2197.440000
2015-04-19    2206.600000
2015-04-26    2105.930000
2015-05-03    1962.237500
2015-05-10    1955.970000
2015-05-17    1958.800000
2015-05-24    2031.520000
2015-05-31    2006.470000
2015-06-07    2023.410000
2015-06-14    1998.270000
2015-06-21     996.560000
2015-06-28    1003.010000
2015-07-05     990.040000
2015-07-12     959.360000
2015-07-19     979.260000
2015-07-26    1080.530000
2015-08-02    1072.120000
2015-08-09    1081.020000
2015-08-16    1129.360000
2015-08-23    1153.300000
2015-08-30    1087.230000
2015-09-06    1091.230000
2015-09-13    1075.490000
2015-09-20    1101.262500
2015-09-27    1117.225000
2015-10-04    1140.600000
2015-10-11    1153.820000
2015-10-18    1102.430000
2015-10-25    1131.550000
2015-11-01    1147.050000
2015-11-08    1134.940000
2015-11-15    1111.712500
2015-11-22    1052.380000
2015-11-29    1053.400000
2015-12-06    1066.880000
2015-12-13    1043.800000
2015-12-20    1086.630000
2015-12-27    1096.100000
2016-01-03    1100.287500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 40 weeks:

 Date
2015-01-04    1993.800000
2015-01-11    1992.310000
2015-01-18    2117.210000
2015-01-25    2161.620000
2015-02-01    2142.112500
2015-02-08    2164.980000
2015-02-15    2283.870000
2015-02-22    2295.762500
2015-03-01    2279.383333
```

```
2015-03-08    2277.950000
2015-03-15    2201.790000
2015-03-22    2244.910000
2015-03-29    2202.500000
2015-04-05    2206.766667
2015-04-12    2197.440000
2015-04-19    2206.600000
2015-04-26    2105.930000
2015-05-03    1962.237500
2015-05-10    1955.970000
2015-05-17    1958.800000
2015-05-24    2031.520000
2015-05-31    2006.470000
2015-06-07    2023.410000
2015-06-14    1998.270000
2015-06-21     996.560000
2015-06-28    1003.010000
2015-07-05     990.040000
2015-07-12     959.360000
2015-07-19     979.260000
2015-07-26    1080.530000
2015-08-02    1072.120000
2015-08-09    1081.020000
2015-08-16    1129.360000
2015-08-23    1153.300000
2015-08-30    1087.230000
2015-09-06    1091.230000
2015-09-13    1075.490000
2015-09-20    1101.262500
2015-09-27    1117.225000
2015-10-04    1140.600000
2015-10-11    1153.820000
2015-10-18    1102.430000
2015-10-25    1131.550000
2015-11-01    1147.050000
2015-11-08    1134.940000
2015-11-15    1111.712500
2015-11-22    1052.380000
2015-11-29    1053.400000
2015-12-06    1066.880000
2015-12-13    1043.800000
2015-12-20    1086.630000
2015-12-27    1096.100000
2016-01-03    1100.287500
Freq: W-SUN, Name: Close, dtype: float64
Following Moving Averages: for 52 weeks:

 Date
2015-01-04    1993.800000
2015-01-11    1992.310000
2015-01-18    2117.210000
2015-01-25    2161.620000
2015-02-01    2142.112500
2015-02-08    2164.980000
2015-02-15    2283.870000
2015-02-22    2295.762500
2015-03-01    2279.383333
2015-03-08    2277.950000
2015-03-15    2201.790000
2015-03-22    2244.910000
2015-03-29    2202.500000
```

```
2015-04-05    2206.766667
2015-04-12    2197.440000
2015-04-19    2206.600000
2015-04-26    2105.930000
2015-05-03    1962.237500
2015-05-10    1955.970000
2015-05-17    1958.800000
2015-05-24    2031.520000
2015-05-31    2006.470000
2015-06-07    2023.410000
2015-06-14    1998.270000
2015-06-21     996.560000
2015-06-28    1003.010000
2015-07-05     990.040000
2015-07-12     959.360000
2015-07-19     979.260000
2015-07-26    1080.530000
2015-08-02    1072.120000
2015-08-09    1081.020000
2015-08-16    1129.360000
2015-08-23    1153.300000
2015-08-30    1087.230000
2015-09-06    1091.230000
2015-09-13    1075.490000
2015-09-20    1101.262500
2015-09-27    1117.225000
2015-10-04    1140.600000
2015-10-11    1153.820000
2015-10-18    1102.430000
2015-10-25    1131.550000
2015-11-01    1147.050000
2015-11-08    1134.940000
2015-11-15    1111.712500
2015-11-22    1052.380000
2015-11-29    1053.400000
2015-12-06    1066.880000
2015-12-13    1043.800000
2015-12-20    1086.630000
2015-12-27    1096.100000
2016-01-03    1100.287500
Freq: W-SUN, Name: Close, dtype: float64
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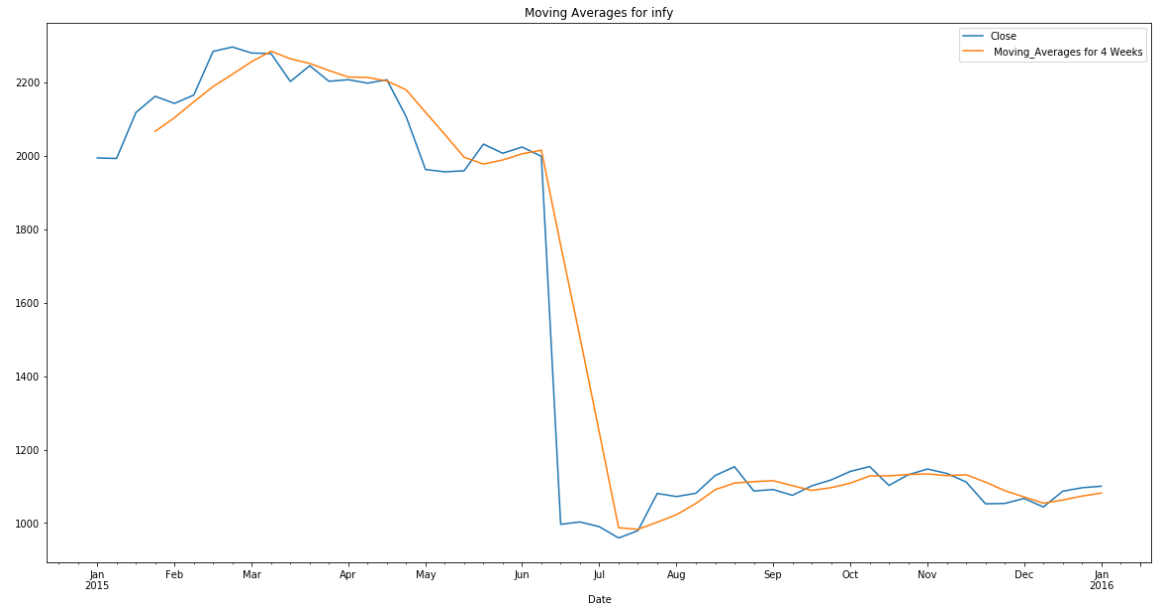
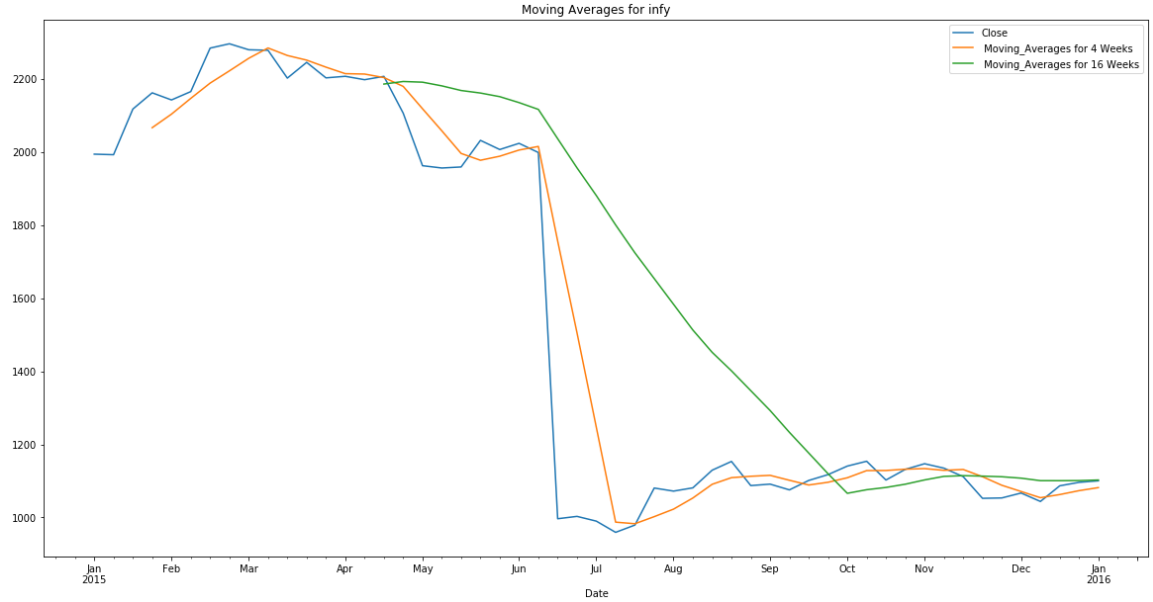
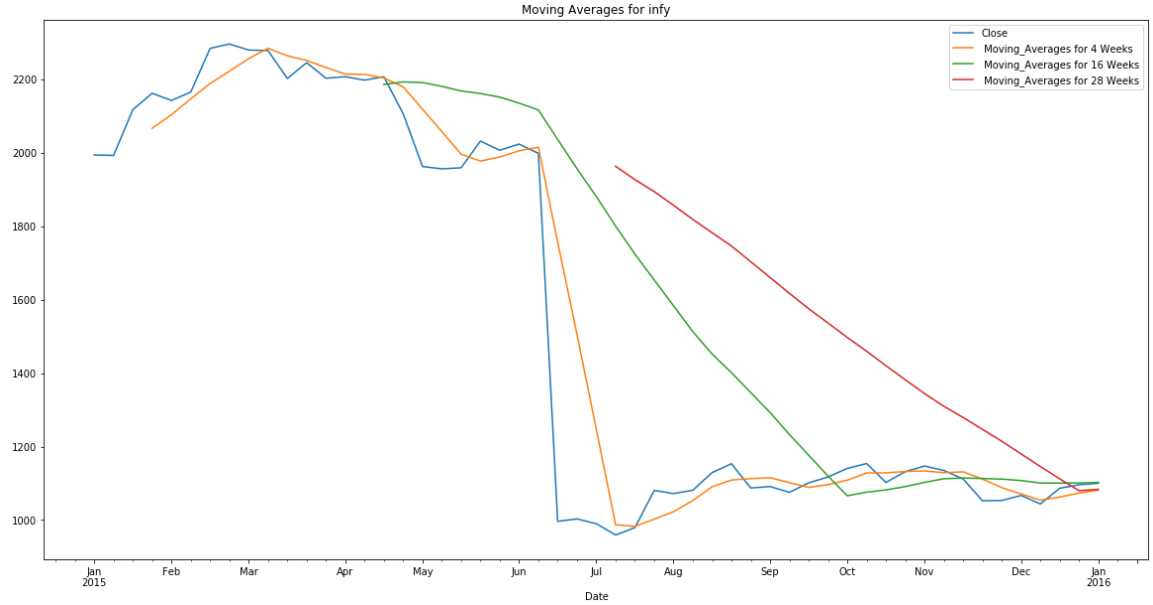
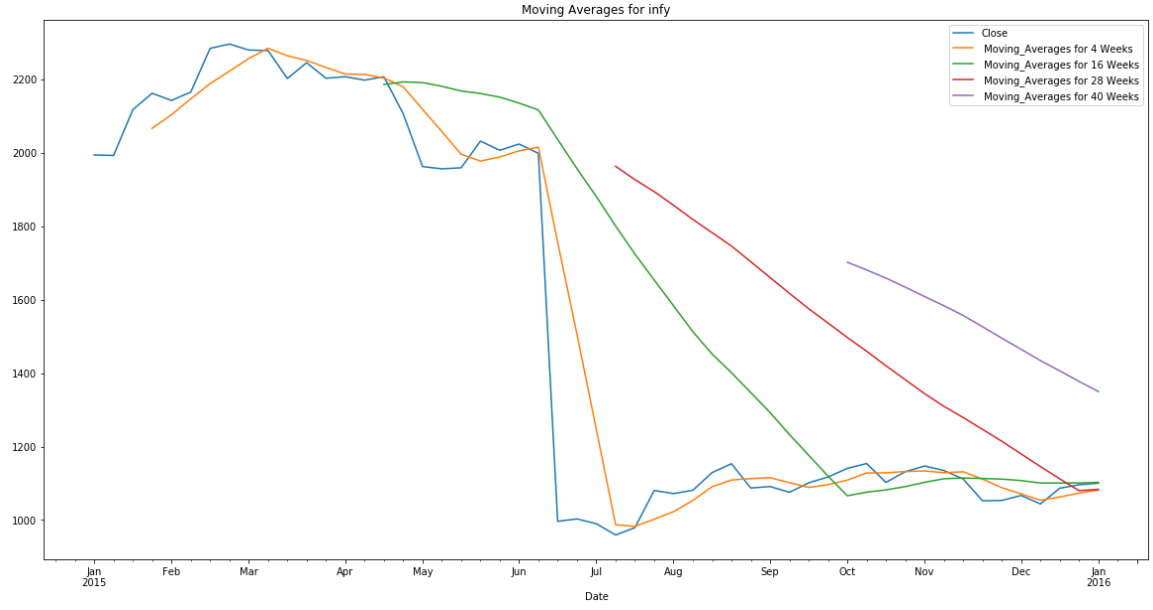
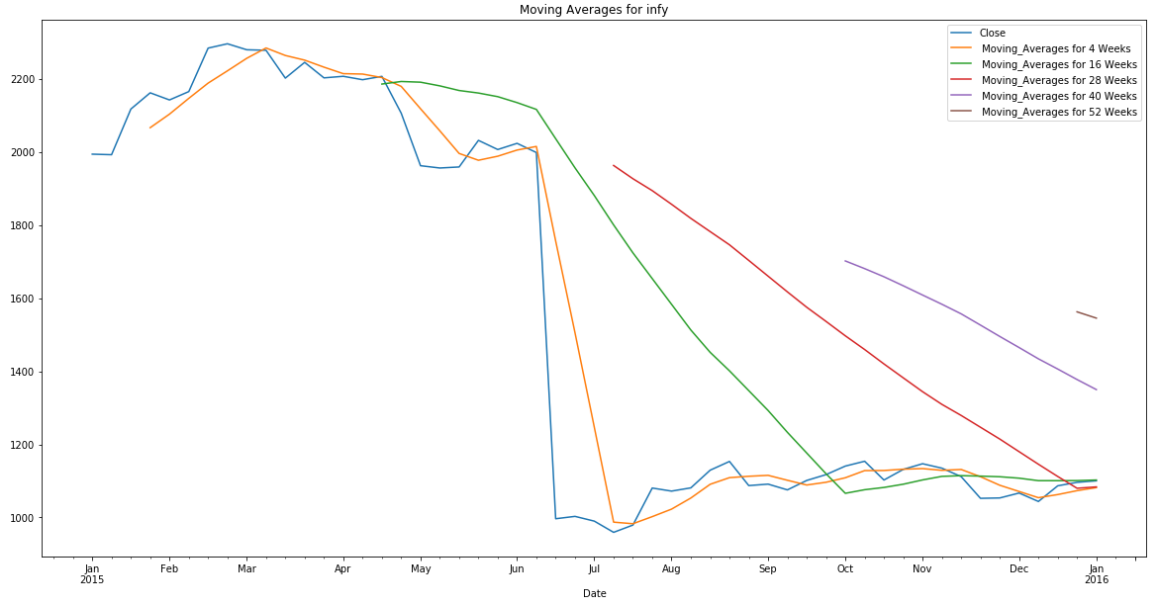



Moving Averages for infy
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
2200
2000
1800
1600
1400
1200
1000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for infy
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
2200
2000
1800
1600
1400
1200
1000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for infy
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
2200
2000
1800
1600
1400
1200
1000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date


Moving Averages for infy
Close
Moving_Averages for 4 Weeks
Moving_Averages for 16 Weeks
Moving_Averages for 28 Weeks
Moving_Averages for 40 Weeks
Moving_Averages for 52 Weeks
2200
2000
1800
1600
1400
1200
1000
Jan 2015
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2016
Date