Output taken from running the code in Eclipse for at least 30 minutes when Python script is running during the time NYSE is open.

Analysis 1:

```
|-----------------------------------------------
Time: 1538067060000 ms
-----------------------------------------------
(MSFT,114.73)
(FB,171.55)
(GOOGL,1216.17375)
(ADBE,270.1225)


-----------------------------------------------
Time: 1538067360000 ms
-----------------------------------------------
(MSFT,114.734000000000001)
(FB,171.544)
(GOOGL,1216.163)
(ADBE,270.126000000000003)


-----------------------------------------------
Time: 1538067660000 ms
-----------------------------------------------
(MSFT,114.737000000000001)
(FB,171.543)
(GOOGL,1215.932)
(ADBE,270.157000000000004)


-----------------------------------------------
Time: 1538067960000 ms
-----------------------------------------------
(MSFT,114.713000000000001)
(FB,171.453000000000003)
(GOOGL,1215.268)
(ADBE,270.181)


<
```

Analysis 2:

```
----------------------------------------------
Time: 1538068440000 ms
----------------------------------------------
(0.033999999999991815,ADBE)
(0.018750000000003979,FB)
(0.0079999999999981355,MSFT)
(-0.03499999999985448,GOOGL)

----------------------------------------------
Time: 1538068740000 ms
----------------------------------------------
(0.028333333333364408,ADBE)
(0.012000000000028876,FB)
(0.006666666666660603,MSFT)
(-0.027999999999792635,GOOGL)


----------------------------------------------
Time: 1538069040000 ms
----------------------------------------------
(0.022500000000003638,ADBE)
(0.022000000000001978,FB)
(0.007499999999993179,MSFT)
(-0.13499999999976353,GOOGL)


----------------------------------------------
Time: 1538069340000 ms
----------------------------------------------
(0.025000000000005684,FB)
(0.018333333333430346,ADBE)
(0.0033333333333303017,MSFT)
(-0.11799999999971078,GOOGL)
```

Analysis 3:

*__**There were 6 outputs generated but since this is a screenshot, I captured it twice to grab for all windows till the end__*

```
------------------------------------------
Time: 1538149200000 ms
------------------------------------------
(MSFT,0.0)
(FB,0.0)
(GOOGL,0.0)
(ADBE,0.0)


------------------------------------------
Time: 1538149500000 ms
------------------------------------------
(MSFT,0.0)
(FB,0.0)
(GOOGL,0.0)
(ADBE,0.0)


------------------------------------------
Time: 1538149800000 ms
------------------------------------------
(MSFT,54.646127812063696)
(FB,49.44569523212422)
(GOOGL,65.39280588861604)
(ADBE,49.07405382950542)


------------------------------------------
Time: 1538150100000 ms
------------------------------------------
(MSFT,49.22673620922289)
(FB,48.771900385748395)
(GOOGL,60.416198050589465)
(ADBE,49.9440059154589)


------------------------------------------
Time: 1538150400000 ms
------------------------------------------
(MSFT,37.96853535511725)
(FB,46.715980762537)
(GOOGL,48.05489709172075)
```

```
(MSFT,0.0)
(FB,0.0)
(GOOGL,0.0)
(ADBE,0.0)

----------------------------------------
Time: 1538149800000 ms
----------------------------------------
(MSFT,54.646127812063696)
(FB,49.44569523212422)
(GOOGL,65.39280588861604)
(ADBE,49.07405382950542)

----------------------------------------
Time: 1538150100000 ms
----------------------------------------
(MSFT,49.22673620922289)
(FB,48.771900385748395)
(GOOGL,60.416198050589465)
(ADBE,49.9440059154589)

----------------------------------------
Time: 1538150400000 ms
----------------------------------------
(MSFT,37.96853535511725)
(FB,46.715980762537)
(GOOGL,48.954889708172075)
(ADBE,43.58516105725807)

----------------------------------------
Time: 1538150700000 ms
----------------------------------------
(MSFT,52.544836173941825)
(FB,50.06470089782431)
(GOOGL,48.587598223867964)
(ADBE,52.03741422377827)
```

Analysis 4:

```
-------------------------------------------
Time: 1538064900000 ms
-------------------------------------------
(196765,FB)
(81081,MSFT)
(12979,ADBE)
(9796,GOOGL)

-------------------------------------------
Time: 1538065500000 ms
-------------------------------------------
(206318,FB)
(51526,MSFT)
(22479,ADBE)
(20595,GOOGL)

-------------------------------------------
Time: 1538066100000 ms
-------------------------------------------
(192426,FB)
(65235,MSFT)
(21278,ADBE)
(14559,GOOGL)
```

Output taken from running the jar from Command Prompt for at least 30 minutes when Python script is running during the time when NYSE was not open

C:\Users\Deepika Chauhan\Downloads>java -cp SparkApplication.jar com.deepika.sparkproject.StockAnalysis "C:\Users\Deepika Chauhan\Desktop\PGP-BDE Docs\Python"

Using Spark's default log4j profile: org/apache/spark/log4j-defaults.properties

18/09/30 14:11:58 INFO SparkContext: Running Spark version 2.2.0

18/09/30 14:11:58 WARN NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable

18/09/30 14:11:58 INFO SparkContext: Submitted application: sparkapplication

18/09/30 14:11:58 INFO SecurityManager: Changing view acls to: Deepika Chauhan

18/09/30 14:11:58 INFO SecurityManager: Changing modify acls to: Deepika Chauhan

18/09/30 14:11:58 INFO SecurityManager: Changing view acls groups to:

18/09/30 14:11:58 INFO SecurityManager: Changing modify acls groups to:

18/09/30 14:11:58 INFO SecurityManager: SecurityManager: authentication disabled; ui acls disabled; users with view permissions: Set(Deepika Chauhan); groups with view permissions: Set(); users with modify permissions: Set(Deepika Chauhan); groups with modify permissions: Set()

18/09/30 14:11:59 INFO Utils: Successfully started service 'sparkDriver' on port 51194.

18/09/30 14:11:59 INFO SparkEnv: Registering MapOutputTracker

18/09/30 14:11:59 INFO SparkEnv: Registering BlockManagerMaster

18/09/30 14:11:59 INFO BlockManagerMasterEndpoint: Using org.apache.spark.storage.DefaultTopologyMapper for getting topology information

18/09/30 14:11:59 INFO BlockManagerMasterEndpoint: BlockManagerMasterEndpoint up

18/09/30 14:11:59 INFO DiskBlockManager: Created local directory at C:\Users\Deepika Chauhan\AppData\Local\Temp\blockmgr-04be798c-c019-49f0-974e-1d8e63c2437e

18/09/30 14:11:59 INFO MemoryStore: MemoryStore started with capacity 355.5 MB

18/09/30 14:11:59 INFO SparkEnv: Registering OutputCommitCoordinator

18/09/30 14:11:59 INFO Utils: Successfully started service 'SparkUI' on port 4040.

18/09/30 14:11:59 INFO SparkUI: Bound SparkUI to 0.0.0.0, and started at http://192.168.1.3:4040

18/09/30 14:12:00 INFO Executor: Starting executor ID driver on host localhost

18/09/30 14:12:00 INFO Utils: Successfully started service 'org.apache.spark.network.netty.NettyBlockTransferService' on port 51215.

18/09/30 14:12:00 INFO NettyBlockTransferService: Server created on 192.168.1.3:51215

18/09/30 14:12:00 INFO BlockManager: Using org.apache.spark.storage.RandomBlockReplicationPolicy for block replication policy

18/09/30 14:12:00 INFO BlockManagerMaster: Registering BlockManager BlockManagerId(driver, 192.168.1.3, 51215, None)

18/09/30 14:12:00 INFO BlockManagerMasterEndpoint: Registering block manager 192.168.1.3:51215 with 355.5 MB RAM, BlockManagerId(driver, 192.168.1.3, 51215, None)

18/09/30 14:12:00 INFO BlockManagerMaster: Registered BlockManager BlockManagerId(driver, 192.168.1.3, 51215, None)

18/09/30 14:12:00 INFO BlockManager: Initialized BlockManager: BlockManagerId(driver, 192.168.1.3, 51215, None)

Creating the output files for Ques1 now ------

Moving average closing prices for 4 stocks :

Creating the output files for Ques2 now ------

Profits of 4 stocks in descending order :

Creating the output files for Ques3 now ------

RSI calculated for each stock are :

Creating the output files for Ques4 now ------

Volume for all stocks in descending order are :

Time: 1538297220000 ms

(MSFT,114.48)

(FB,164.445)

(GOOGL,1207.5500000000002)

(ADBE,269.9825)

Time: 1538297220000 ms

(0.2687500000000682,ADBE)

(0.18005000000039217,GOOGL)

(0.16149999999998954,FB)

(0.08500000000000796,MSFT)

Time: 1538297220000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

Time: 1538297520000 ms

(MSFT,114.47999999999999)

(FB,164.44400000000002)

(GOOGL,1207.516)

(ADBE,269.98400000000004)

Time: 1538297520000 ms

(0.27100000000007185,ADBE)

(0.1605000000000132,FB)

(0.15004000000021733,GOOGL)

(0.08399999999998897,MSFT)

Time: 1538297520000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

Time: 1538297520000 ms

(5689003,MSFT)

(4455482,FB)

(483970,GOOGL)

(478156,ADBE)

Time: 1538297820000 ms

(MSFT,114.47999999999999)

(FB,164.442)

(GOOGL,1207.516)

(ADBE,269.986)

Time: 1538297820000 ms

(0.274000000000009,ADBE)

(0.15850000000000364,FB)

(0.15004000000021733,GOOGL)

(0.08599999999998431,MSFT)

Time: 1538297820000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

Time: 1538298120000 ms

(MSFT,114.47999999999999)

(FB,164.442)

(GOOGL,1207.5840000000003)

(ADBE,269.986)

Time: 1538298120000 ms

(0.274000000000009,ADBE)

(0.21006000000033964,GOOGL)

(0.15850000000000364,FB)

(0.08599999999998431,MSFT)

Time: 1538298120000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

Time: 1538298120000 ms

(5688404,MSFT)

(3702810,FB)

(493080,GOOGL)

(473784,ADBE)

Time: 1538298420000 ms

(MSFT,114.47999999999999)

(FB,164.442)

(GOOGL,1207.5840000000003)

(ADBE,269.98400000000004)

Time: 1538298420000 ms

(0.27100000000007185,ADBE)

(0.21006000000033964,GOOGL)

(0.15850000000000364,FB)

(0.08399999999998897,MSFT)

Time: 1538298420000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

Time: 1538298720000 ms

(MSFT,114.47999999999999)

(FB,164.442)

(GOOGL,1207.5840000000003)

(ADBE,269.98400000000004)

Time: 1538298720000 ms

(0.27100000000007185,ADBE)

(0.21006000000033964,GOOGL)

(0.15850000000000364,FB)

(0.08399999999998897,MSFT)

Time: 1538298720000 ms

(MSFT,0.0)

(FB,0.0)

(GOOGL,0.0)

(ADBE,0.0)

\-

Time: 1538298720000 ms

\-

(6258682,MSFT)

(3707654,FB)

(483970,GOOGL)

(471598,ADBE)

The output files were generated like:

Name	Date modified
Ques1_Output-1538296500000._result	30-09-2018 14:05
Ques2_Output-1538296500000._result	30-09-2018 14:05
Ques3_Output-1538296500000._result	30-09-2018 14:05
Ques1_Output-1538297220000._result	30-09-2018 14:17
Ques2_Output-1538297220000._result	30-09-2018 14:17
Ques3_Output-1538297220000._result	30-09-2018 14:17
Ques1_Output-1538297520000._result	30-09-2018 14:22
Ques2_Output-1538297520000._result	30-09-2018 14:22
Ques3_Output-1538297520000._result	30-09-2018 14:22
Ques4_Output-1538297520000._result	30-09-2018 14:22
Ques1_Output-1538297820000._result	30-09-2018 14:27
Ques2_Output-1538297820000._result	30-09-2018 14:27
Ques3_Output-1538297820000._result	30-09-2018 14:27
Ques1_Output-1538298120000._result	30-09-2018 14:32
Ques2_Output-1538298120000._result	30-09-2018 14:32
Ques3_Output-1538298120000._result	30-09-2018 14:32
Ques4_Output-1538298120000._result	30-09-2018 14:32
Ques1_Output-1538298420000._result	30-09-2018 14:37
Ques2_Output-1538298420000._result	30-09-2018 14:37
Ques3_Output-1538298420000._result	30-09-2018 14:37
Ques1_Output-1538298720000._result	30-09-2018 14:42
Ques2_Output-1538298720000._result	30-09-2018 14:42
Ques3_Output-1538298720000._result	30-09-2018 14:42
Ques4_Output-1538298720000._result	30-09-2018 14:42