CSE 216 – Programming Abstractions (Fall 2019)

Programming Assignment # 1

In this assignment, you will create a software program that shows a particular statistics requested by a user. The program will be developed in Java language using Apache NetBeans 11.x as IDE.

The data presented in this assignment is taken from Huge Stock Market Dataset[1] made available by Boris Marjanovic on Kaggle – which is an online community of data scientists. This dataset contains CSV dataset folder ETFs presenting stock market data of an Exchange Traded Fund (ETF). There are three types of stock charts:

1. High-Low Charts show the high and low price a stock attained for a particular period of time. The chart displays a series of vertical lines where the top of the line shows the high price, the bottom of the line the low price.
2. Open-High-Low-Close Charts show the high and low price a stock attained for a particular period of time as well as the opening and closing prices of the stock for the same period. The chart shows the same type of vertical lines displayed on a high-low chart. The opening and closing prices can be shown in two ways: by markers on the line, or by open-close bars superimposed on the high-low lines.
3. Volume Charts show the volume of trading, and often appear as studies below the main chart. Volume charts can be simple line charts, column charts, column charts in which the columns appear as lines, or line charts showing drop lines.

See for details: http://www.mit.edu/~mbarker/formula1/f1help/11-ch-10.htm

We will use JFreeChart library to plot these charts according to requirement. See for details: http://www.jfree.org/jfreechart/.

In this assignment, I have provided you a basic project template. You need to extend this template to complete desired functionality. The project also has three basic examples of High-Low chart, Open-High-Low-Close chart and Volume Chart. These examples are given for reference and need to be modified for the tasks given in this assignment.

Your tasks are the following (On Apache NetBeans 11.1):

1) **File -> Import Project from Zip -> Import BasicVisualAnalytics project uploaded at blackboard/course webpage. The ETFs dataset is in resources folder.**
2) **Select Run -> Build Project.**
3) **Select Run.**

This should display HashMap values containing an alphabet and all ticker codes for those alphabets. It will also display the path of data files corresponding to each ticker.

[1] Huge Stock Market Dataset, https://www.kaggle.com/borismarjanovic/price-volume-data-for-all-us-stocks-etfs.

You will extend this basic project to provide the following user interaction:

4) **User interaction:** See the following flowchart for modeling user interaction:

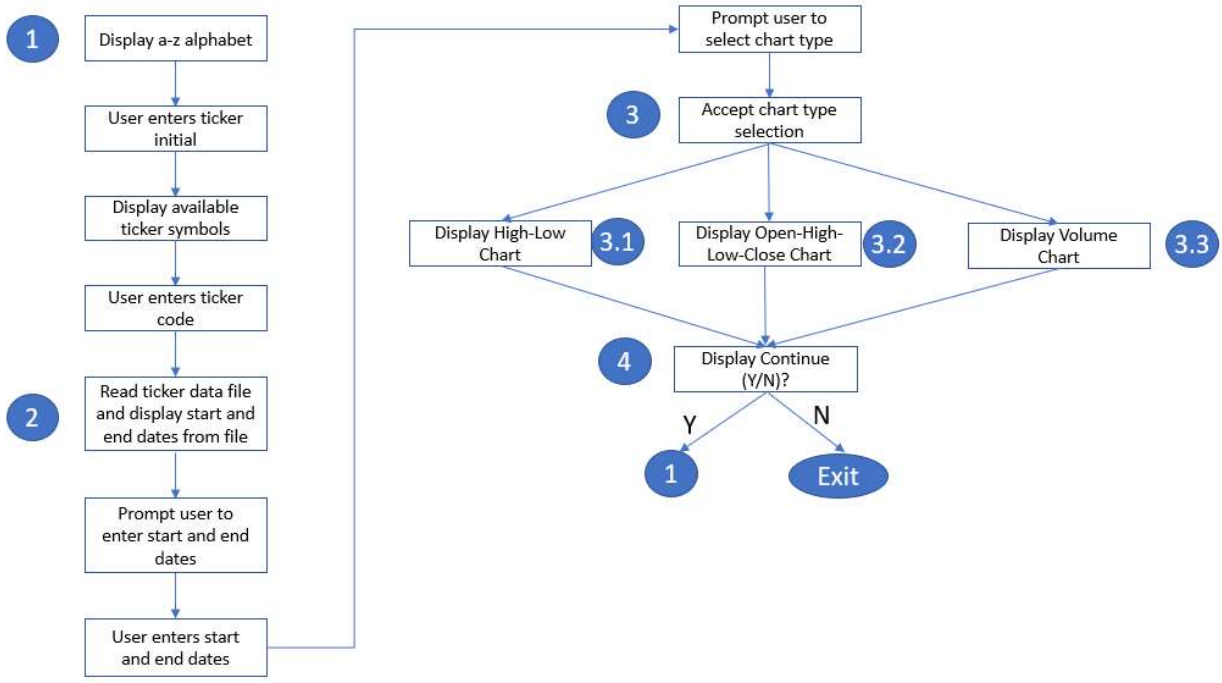


Figure 1: User interaction workflow

You are free to code as you like to model above user interaction. An example of user interaction is provided after the following section of assignment. Make sure to handle any erroneous inputs – like invalid ticker names, invalid date formats.

5) **Building and running on command-line:** The project is named **BasicVisualAnalytics**.
Select Run -> Build project to create an executable jar. The executable jar should appear in target folder with name BasicVisualAnalytics-1.0-SNAPSHOT-jar-with-dependencies.jar.
Run executable jar using ETFs folder path as command line argument. E.g. on my computer I do it as follows:

```
C:\pravinp\SUNYK\Fall2019\CSE216\assignments\assignment1\BasicVisualAnalytics\target>java -jar BasicVisualAnalytics-1.0-SNAPSHOT-jar-with-dependencies.jar ../resources/ETFs
```

6) Submission:
Select File -> Export Project to Zip and save project as a zip file.

Submit the exported zip, and executable jar (`BasicVisualAnalytics-1.0-SNAPSHOT-jar-with-dependencies.jar`) as a proof that you have completed this assignment.

7) **Evaluation:** A slot will be announced for evaluating the assignments. During this time the graduate TA will download and run your program and it will be checked for correctness using a few use-cases. If required, the graduate TA will contact you for clarifications.

   Evaluation Rubric: (Total points: 40)

   1. Proper submission: Project zip + executable Jar 5 pts
   2. Reaching point 2 of user interaction: +5 pts
   3. Reaching point 3 of user interaction: +5 pts
   4. Displaying proper charts (3.1, 3.2, 3.3): +5 pts each (15 points total)
   5. Reaching point 4 of user interaction: +5 pts
   6. Restarting from point 1: + 5 pts

Note:

If your code does not compile, it will not be graded.

Late submissions will not be accepted under any circumstances. Submit whatever you can if you were not able to fully complete the assignment.

To be safe, always, ALWAYS, prepare to submit ahead of time, not exactly AT last moment!

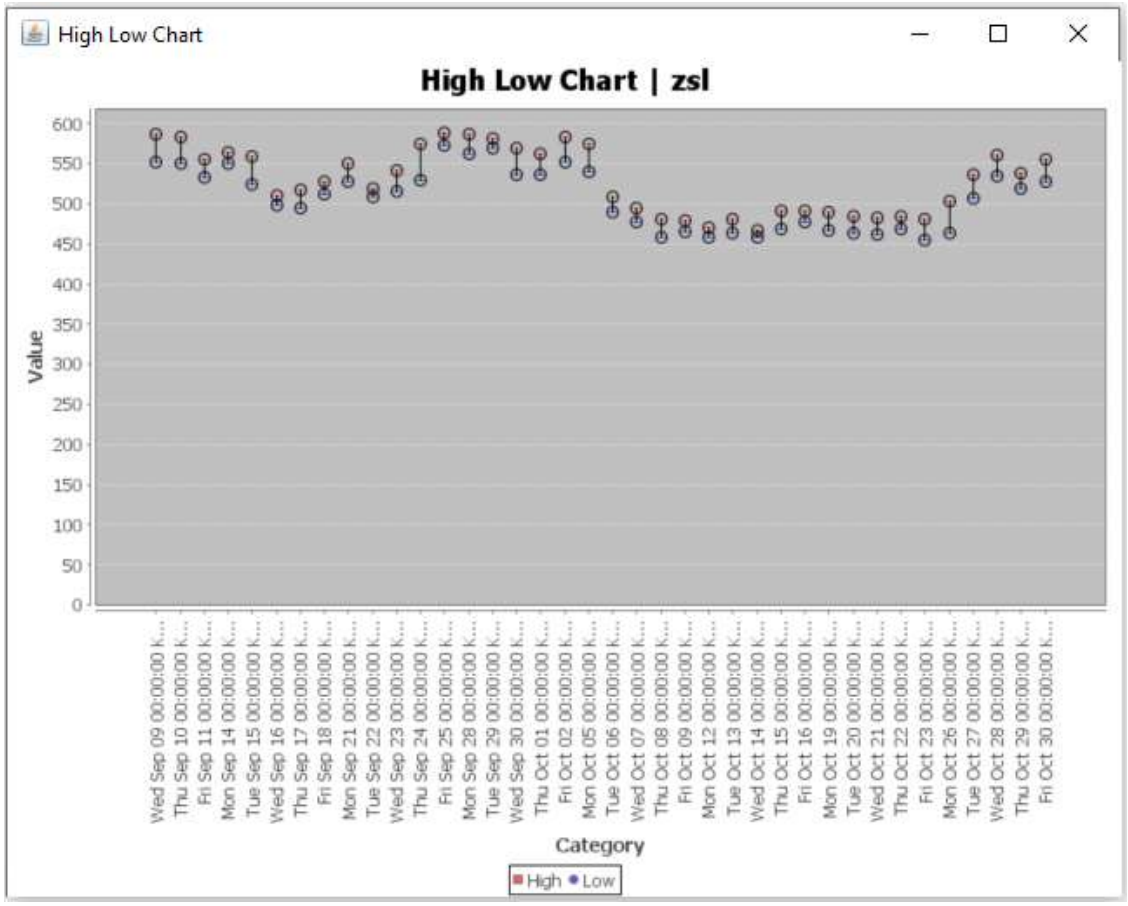
Submission deadline: Monday 30 September, 11:59 PM

An example of user interaction is shown below:

```
------------------------------------------------------------------------
Building BasicVisualAnalytics 1.0-SNAPSHOT
------------------------------------------------------------------------

Arguments are: resources/ETFs
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
Enter ticker initial:
z
ziv
zmlp
zroz
zsl
Enter ticker code:
zsl
Reading                                                          file
C:\pravinp\SUNYK\Fall2019\CSE216\assignments\assignment1\BVACompl
etedAssignment\BasicVisualAnalytics\resources\ETFs\zsl.us.txt
StartDate = 2008-12-03 EndDate = 2017-11-10
Enter valid startdate in the format YYYY-MM-DD:
2009-09-09
Enter valid enddate in the format YYYY-MM-DD:
```

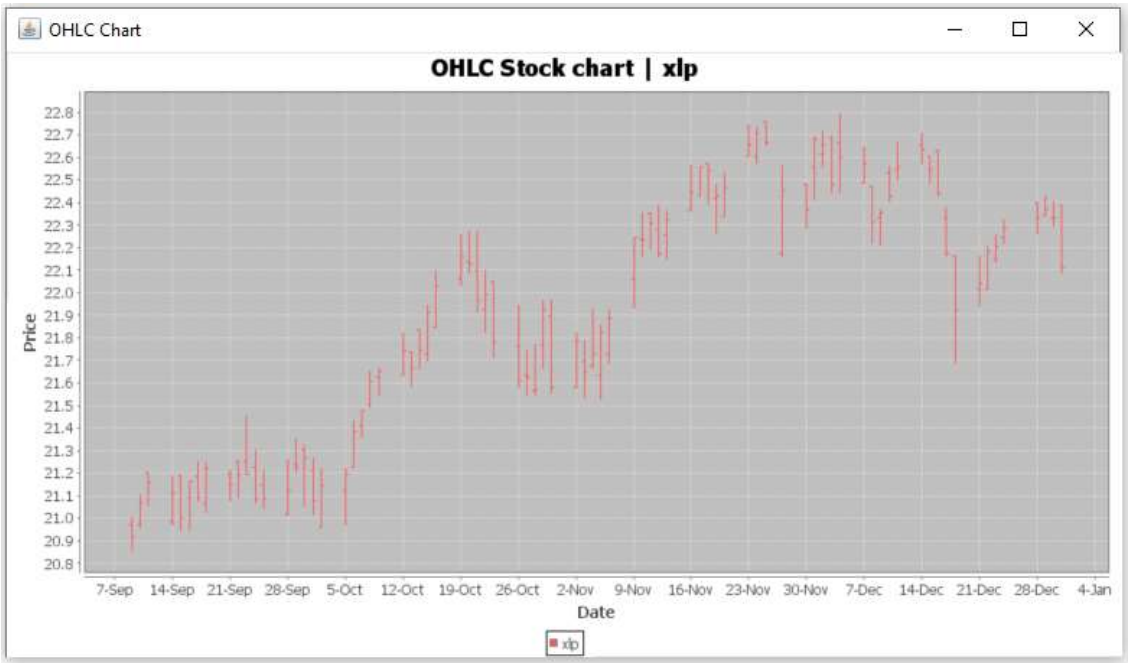
2009-10-30
startDate Wed Sep 09 00:00:00 KST 2009 EndDate = Fri Oct 30 00:00:00 KST 2009
Enter chart type number from the following:
1. High-Low chart
2. Open-High-Low-Close chart
3. Volume Chart
1



Continue?(Y/N)
Y
a
b
c
d
e
f
g
h
i
j
k
l
m

```
n
o
p
q
r
s
t
u
v
w
x
y
z
Enter ticker initial:
x
xar
xbi
xes
xhb
xhe
xhs
xiv
xlb
xle
xlf
xlg
xli
xlk
xlp
xlu
xlv
xly
xme
xmlv
xmpt
xop
xph
xpp
xrlv
xrt
xsd
xslv
xsoe
xsw
xt
xtl
xtn
xvz
```

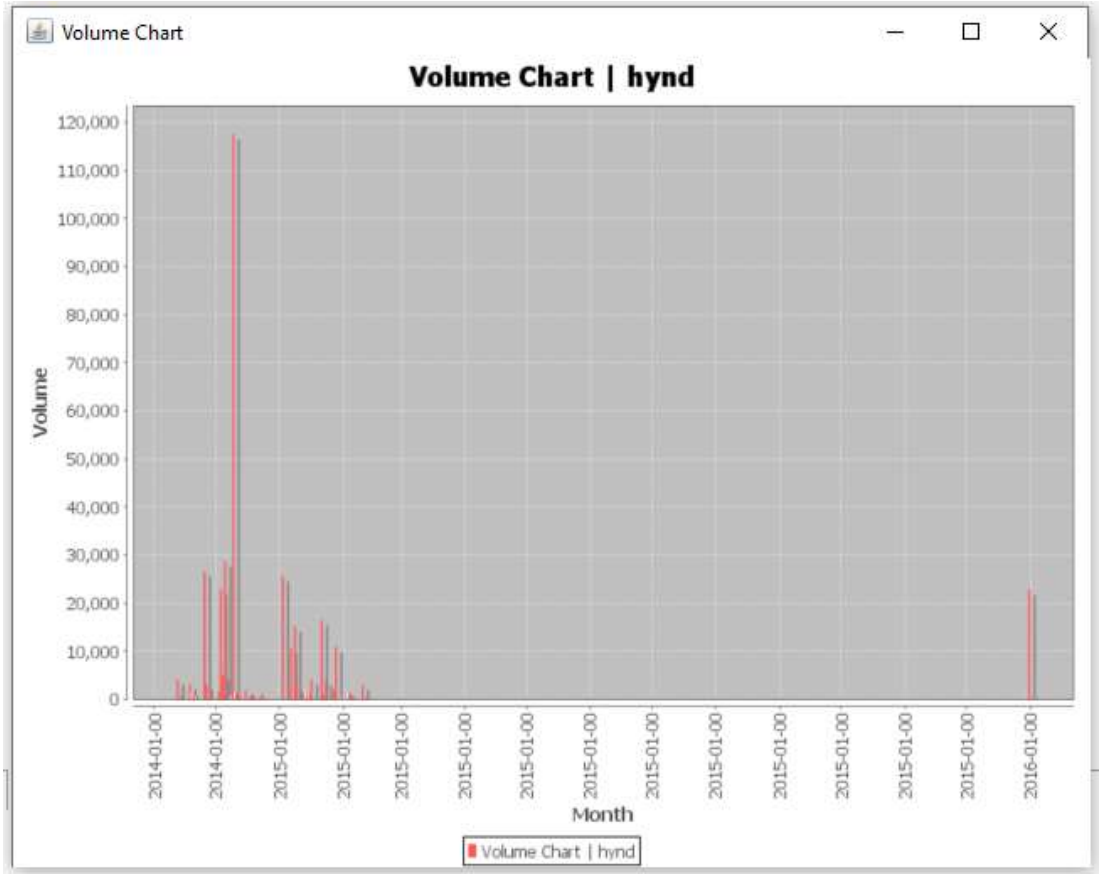
```
Enter ticker code:
xlp
Reading                                                    file
C:\pravinp\SUNYK\Fall2019\CSE216\assignments\assignment1\BVACompl
etedAssignment\BasicVisualAnalytics\resources\ETFs\xlp.us.txt
StartDate = 2005-02-25 EndDate = 2017-11-10
Enter valid startdate in the format YYYY-MM-DD:
2009-09-09
Enter valid enddate in the format YYYY-MM-DD:
2009-12-31
startDate Wed Sep 09 00:00:00 KST 2009 EndDate = Thu Dec 31 00:00:00
KST 2009
Enter chart type number from the following:
1. High-Low chart
2. Open-High-Low-Close chart
3. Volume Chart
2
```




```
Continue?(Y/N)
Y
a
b
c
d
e
f
g
h
i
j
```

```
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
Enter ticker initial:
h
hao
hap
hdg
hdge
hdv
heco
hedj
heem
hefa
hevy
hewg
hewj
hezu
hgi
hilo
hold
hspx
huse
hyd
hyem
hyg
hygh
hyih
hyld
hyls
hymb
hynd
hys
hyzd
Enter ticker code:
```

```
hynd
Reading                                                    file
C:\pravinp\SUNYK\Fall2019\CSE216\assignments\assignment1\BVACompl
etedAssignment\BasicVisualAnalytics\resources\ETFs\hynd.us.txt
StartDate = 2013-12-20 EndDate = 2017-11-10
Enter valid startdate in the format YYYY-MM-DD:
2014-11-12
Enter valid enddate in the format YYYY-MM-DD:
2015-02-12
startDate Wed Nov 12 00:00:00 KST 2014 EndDate = Thu Feb 12 00:00:00
KST 2015
Enter chart type number from the following:
1. High-Low chart
2. Open-High-Low-Close chart
3. Volume Chart
3
```




```
Continue?(Y/N)
N
```