



Course Programming Project

DePaul Stock Exchange (DSX)

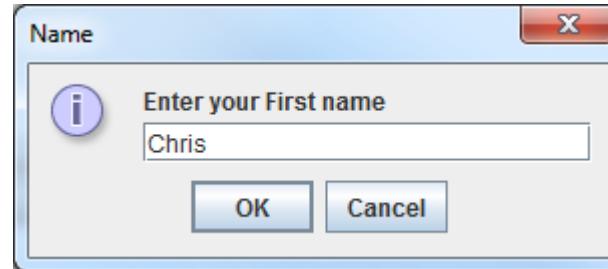
Testing Phase 6



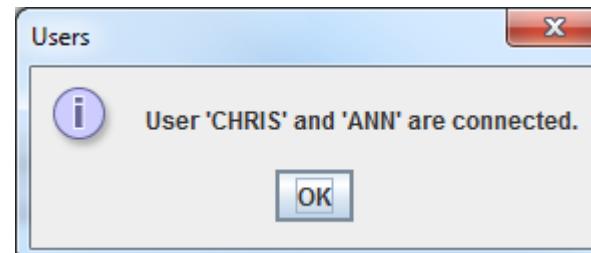
Testing of Phase 6 will occur in 2 phases. One is a manual test where you will operate 2 GUIs (as though you were 2 users) according to a test plan. The other test is uses user simulators. 5 simulated users will perform trading activity while you watch on your GUI, and you watch for errors in the application's output.

Phase 6 Manual Testing.

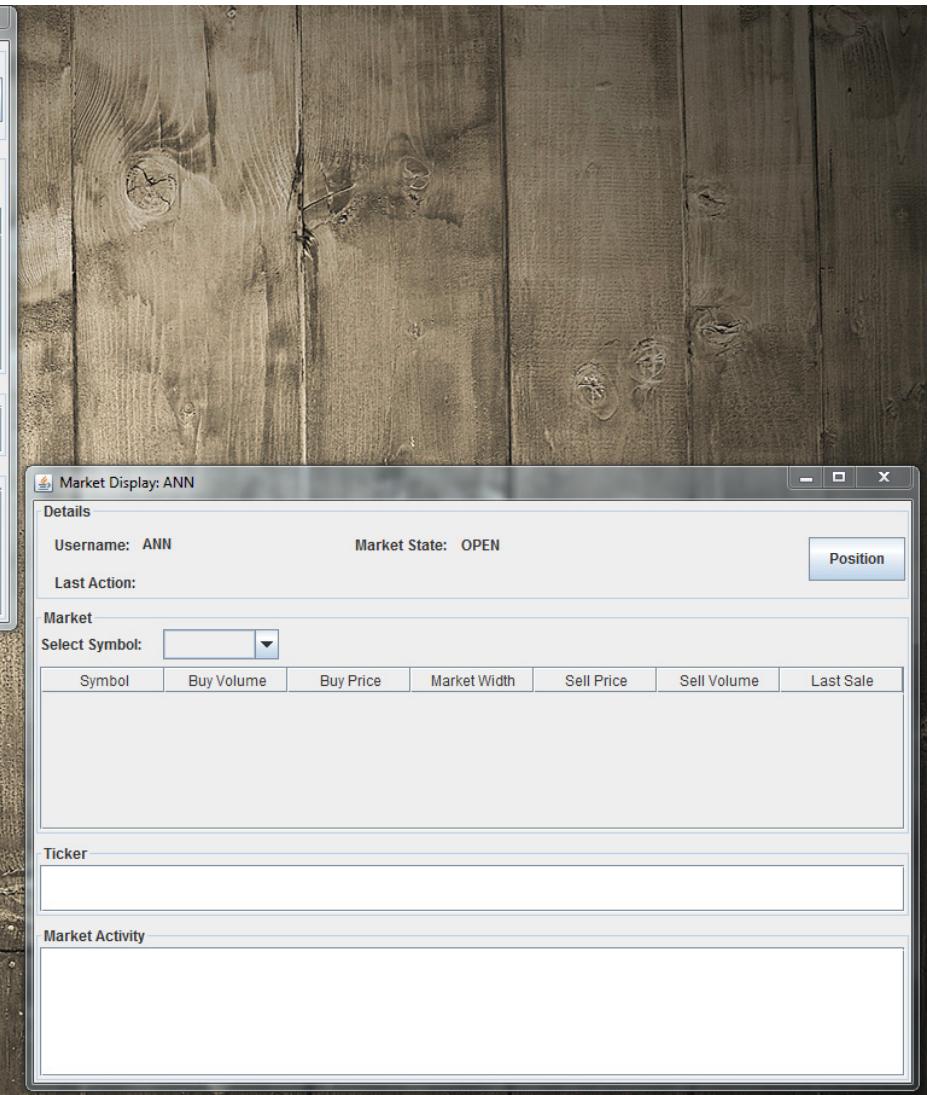
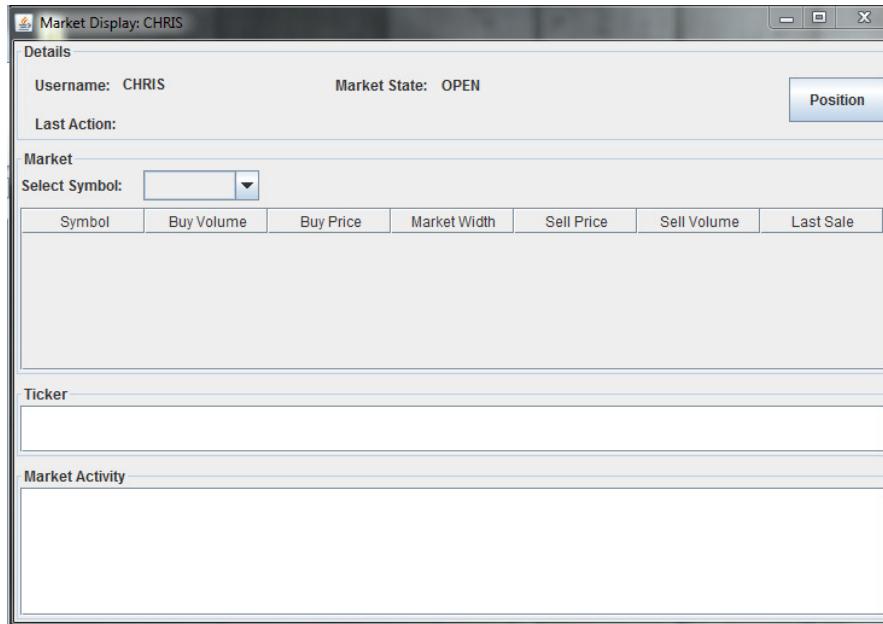
1. Run the “*MainManualTest*” driver to start the manual test. This will first ask for your first name. Enter a name and click “OK”:



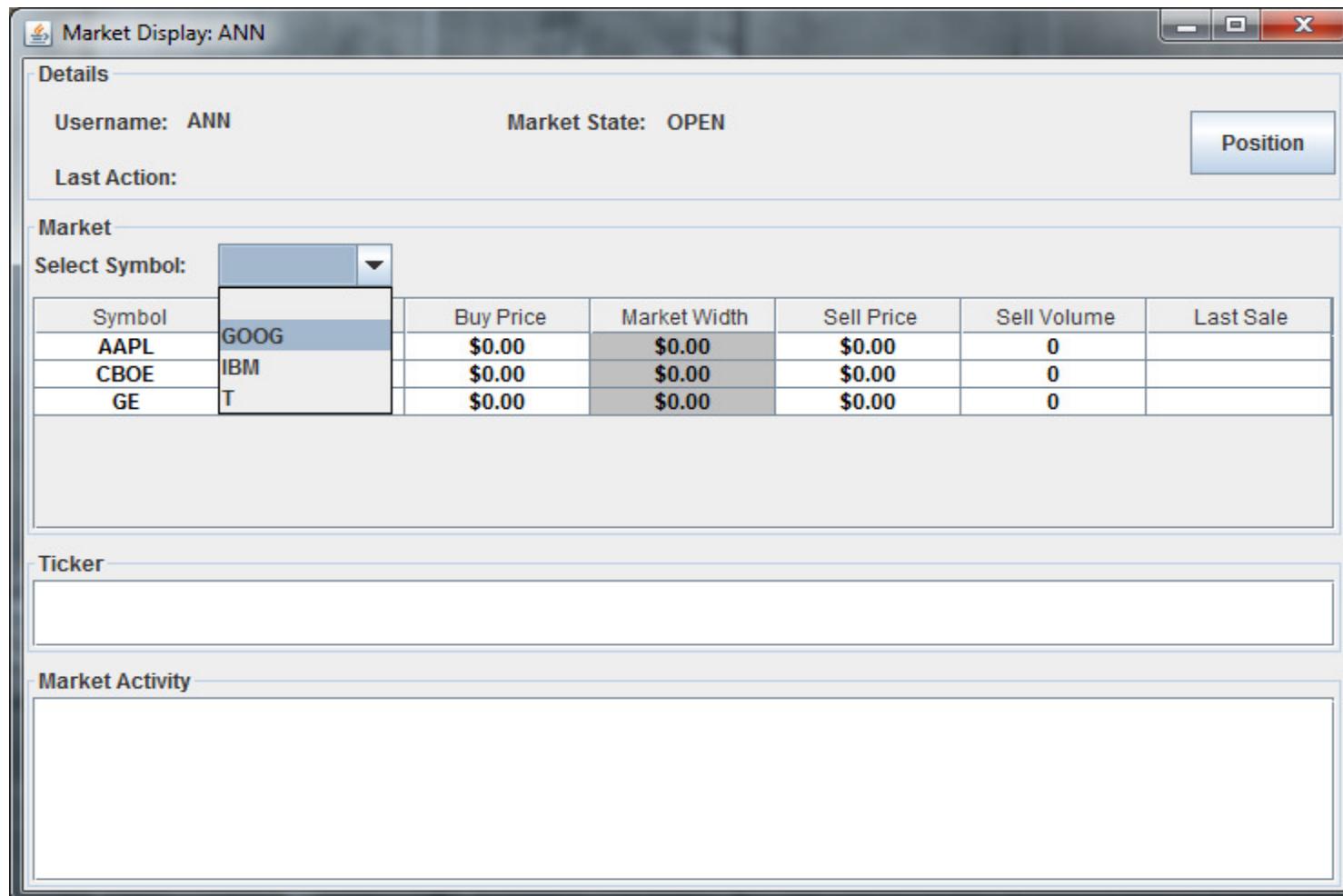
2. Two test users will then be created and connected to the trading system, one with the name you provided, the other with the default name of “ANN”. Click “OK”:



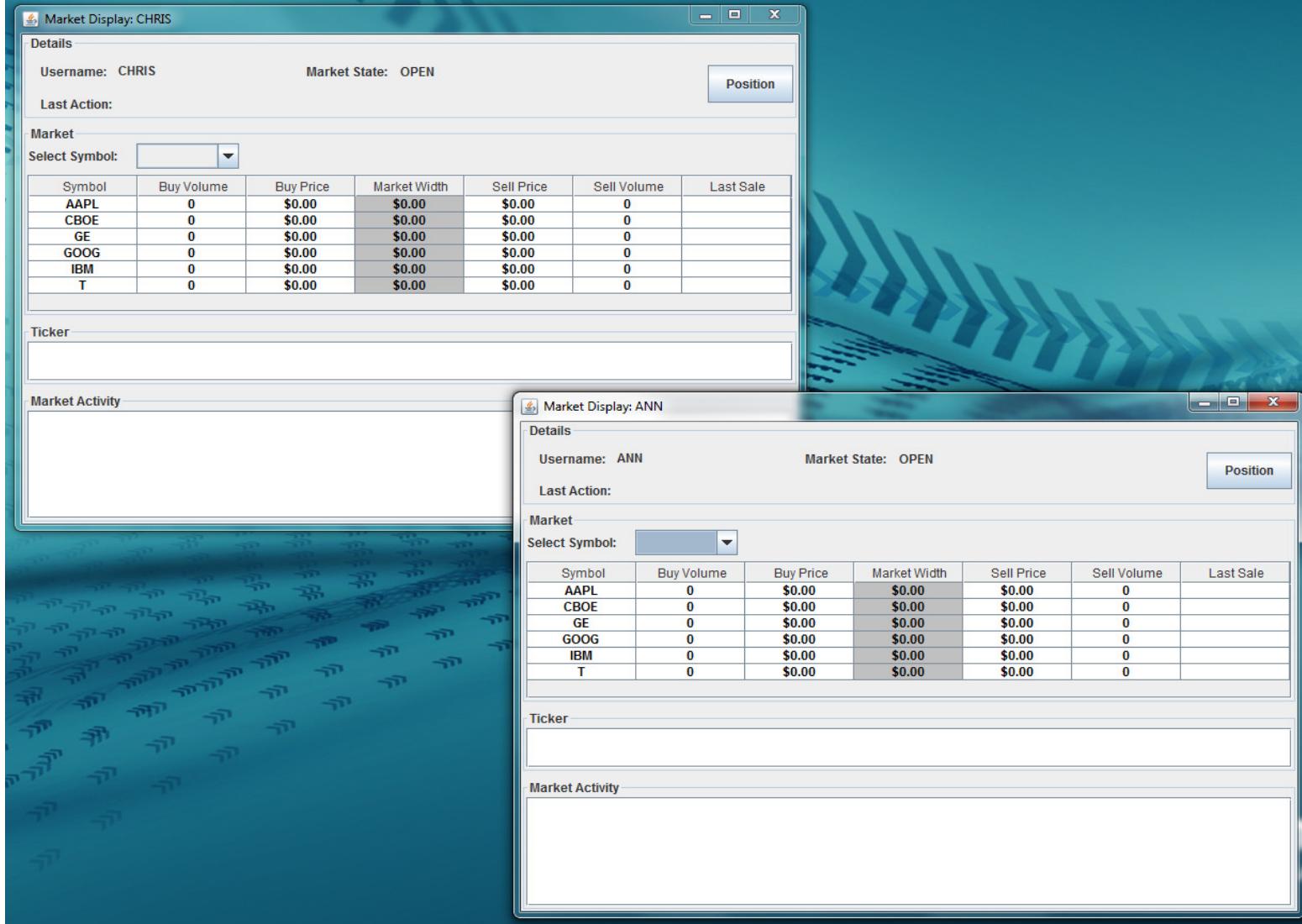
3. Two Market Display GUI's will be displayed (they might initially appear right on top of the other so you might have to move one over in order to see both):



4. Add *all* available stock symbols to both market displays (there are 6 of them). *To do this*, click on the Combo-Box labeled “Select Symbol” found in the “Market” section of the GUI and pick the first symbol in that list (initially the first symbol will be AAPL). Continue doing this until all 6 stock symbols (AAPM, CBOE, GE, GOOG, IBM, T) are displayed in the Market Display tables. This process is shown below:



5. The resulting market displays should look as shown:



The image displays two separate instances of a "Market Display" application window, each showing a different user profile. Both windows have a title bar "Market Display: <username>" where <username> is either "CHRIS" or "ANN".

Window 1 (User: CHRIS):

- Details:** Username: CHRIS, Market State: OPEN, Position button.
- Last Action:** (empty)
- Market:** A table showing market data for symbols AAPL, CBOE, GE, GOOG, IBM, and T. All values are \$0.00.
- Ticker:** (empty)
- Market Activity:** (empty)

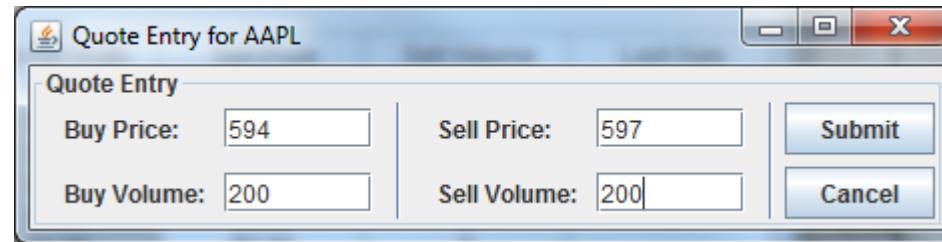
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	0	\$0.00	\$0.00	\$0.00	0	
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Window 2 (User: ANN):

- Details:** Username: ANN, Market State: OPEN, Position button.
- Last Action:** (empty)
- Market:** A table showing market data for symbols AAPL, CBOE, GE, GOOG, IBM, and T. All values are \$0.00.
- Ticker:** (empty)
- Market Activity:** (empty)

Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	0	\$0.00	\$0.00	\$0.00	0	
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

6. Next, enter a quote for AAPL using user ANN's GUI: Buy Price \$594.00, Buy Volume 200, Sell Price \$597.00, Sell Volume 200. *To do this, right click anywhere in the AAPL row in the Market Display table of ANN's GUI and select pop-up menu option “Enter Quote”. Click Submit to “Submit” to enter the Quote.*



7. Both GUI's Market Displays should reflect the current market of 200@594.00 – 200@597.00 (Market Width: \$3.00):

Market Display: ANN

Details	Username: ANN	Market State: OPEN	Position			
Last Action: Enter Quote for AAPL at 2012-11-04 20:13:45.662						
Market	Select Symbol:					
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	200	\$594.00	\$3.00	\$597.00	200	
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Ticker

Market Activity

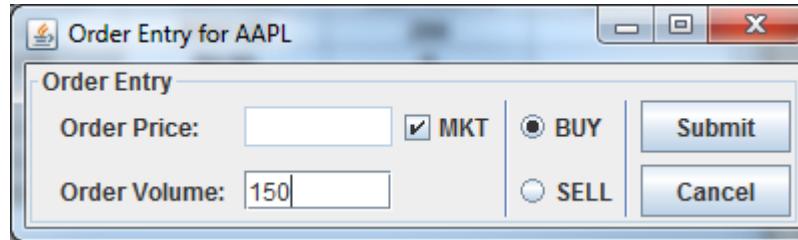
Market Display: CHRIS

Details	Username: CHRIS	Market State: OPEN	Position			
Last Action:						
Market	Select Symbol:					
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	200	\$594.00	\$3.00	\$597.00	200	
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Ticker

Market Activity

8. Next, enter an AAPL order using the GUI for the user with *your* name: BUY 150@MKT. *To do this*, right click anywhere in the AAPL row in the Market Display table of the GUI with your name in it, and select pop-up menu option “Enter Order”. Submit to “Submit” to enter the Quote:



9. That MKT order will trade with ANN's quote. Both GUI's Market Displays should reflect the new AAPL Current Market of 200@594.00 – 50@597.00 (Market Width: \$3.00), and a Last Sale of 150@597.00. Both GUI's Ticker Displays should show “AAPL \$597.00”, and each GUI should display a Fill Message in the Market Activity section:

YOURS: {2012-10-31 15:20:26.282} Fill Message: BUY 150 AAPL at \$597.00 leaving 0 [Tradable Id: CHRISAAPLMKT1249582693736538]
 ANNs: {2012-10-31 15:20:26.265} Fill Message: SELL 150 AAPL at \$597.00 leaving 50 [Tradable Id: ANNAAPL1249366983720505]

Market Display: ANN

Market						
Select Symbol:	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	200	\$594.00	\$3.00	\$597.00	50	150@\$597.00
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Ticker
AAPL \$597.00

Market Activity
{2012-11-04 20:16:59.047} Fill Message: SELL 150 AAPL at \$597.00 leaving 50 [Tradable Id: ANNAAPL9639269218762]

Market Display: CHRIS

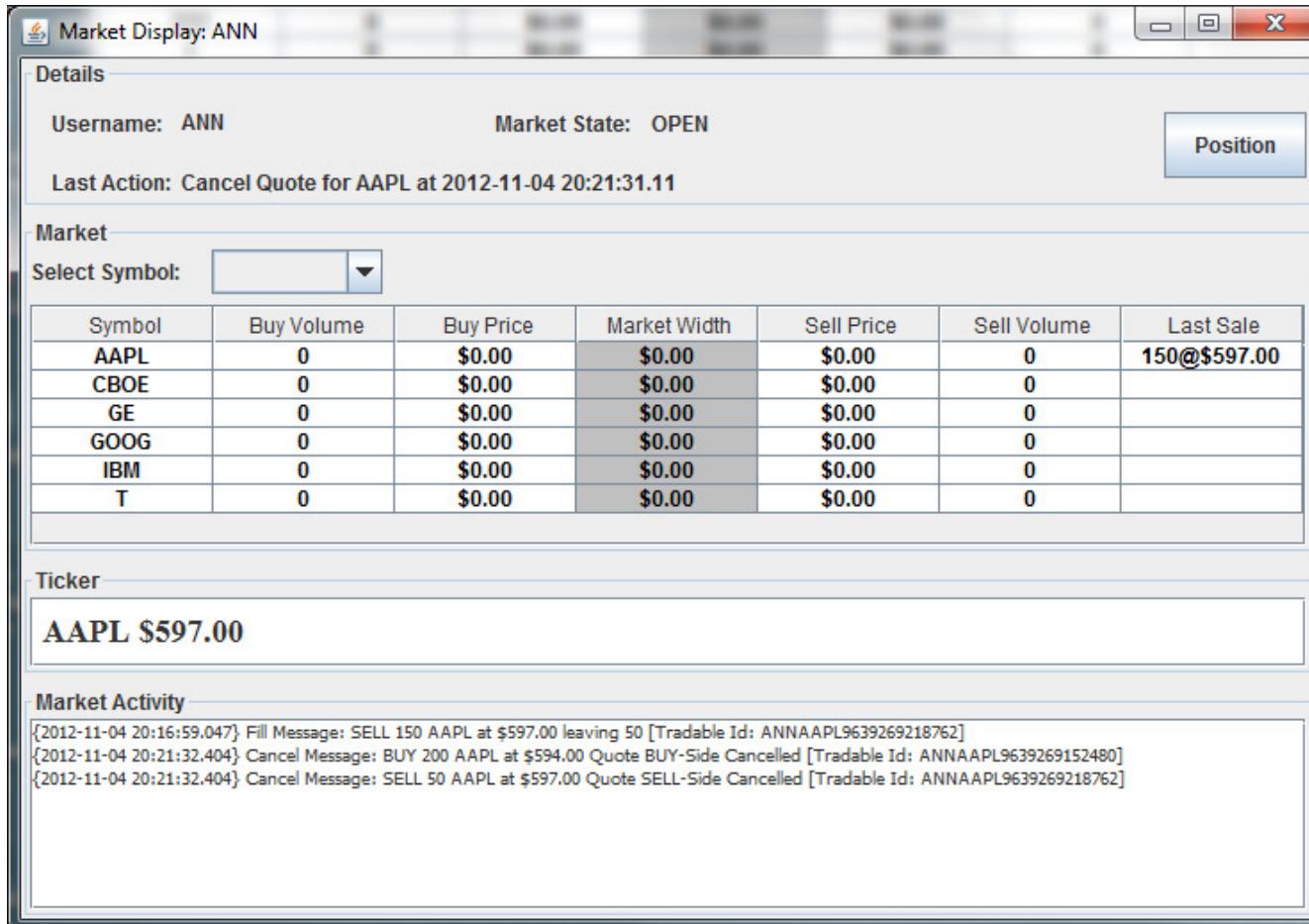
Market						
Select Symbol:	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	200	\$594.00	\$3.00	\$597.00	50	150@\$597.00
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Ticker
AAPL \$597.00

Market Activity
{2012-11-04 20:16:59.076} Fill Message: BUY 150 AAPL at \$597.00 leaving 0 [Tradable Id: CHRISAAPLMKT9822427344327]

10. Now cancel user ANN's quote at her GUI. Both GUI's Market Displays should reflect the new AAPL Current Market of 0@0.00 – 0@0.00. ANN's GUI should display 2 new Cancel Messages in the Market Activity section. *To do this*, right click anywhere in the AAPL row in the Market Display table of ANN's GUI and select pop-up menu option "Cancel Quote":

{2012-10-31 15:26:28.213} Cancel Message: BUY 200 AAPL at \$594.00 Quote BUY-Side Cancelled [Tradable Id: ANNAAPL1249366983696637]
{2012-10-31 15:26:28.216} Cancel Message: SELL 50 AAPL at \$597.00 Quote SELL-Side Cancelled [Tradable Id: ANNAAPL1249366983720505]



The screenshot shows a Windows application window titled "Market Display: ANN". The window has a tabbed interface with three tabs: "Details", "Market", and "Ticker".

Details: Shows the Username: ANN and Market State: OPEN. A "Position" button is visible.

Market: A table showing market data for various symbols. The columns are Symbol, Buy Volume, Buy Price, Market Width, Sell Price, Sell Volume, and Last Sale.

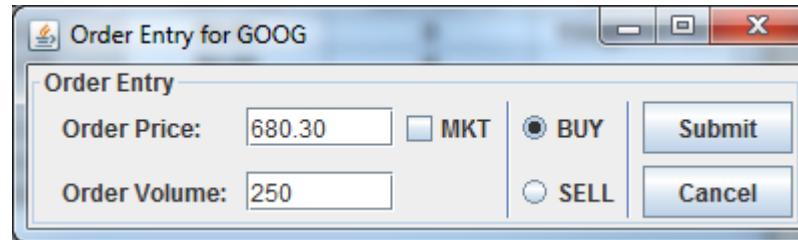
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	0	\$0.00	\$0.00	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Ticker: Displays the current price of AAPL as \$597.00.

Market Activity: A scrollable list showing recent messages:

- {2012-11-04 20:16:59.047} Fill Message: SELL 150 AAPL at \$597.00 leaving 50 [Tradable Id: ANNAAPL9639269218762]
- {2012-11-04 20:21:32.404} Cancel Message: BUY 200 AAPL at \$594.00 Quote BUY-Side Cancelled [Tradable Id: ANNAAPL9639269152480]
- {2012-11-04 20:21:32.404} Cancel Message: SELL 50 AAPL at \$597.00 Quote SELL-Side Cancelled [Tradable Id: ANNAAPL9639269218762]

11. Next, enter a GOOG order using the GUI for the user with *your* name: BUY 250@ 680.30. *To do this*, right click anywhere in the GOOG row in the Market Display table of the GUI with your name in it, and select pop-up menu option “Enter Order”:

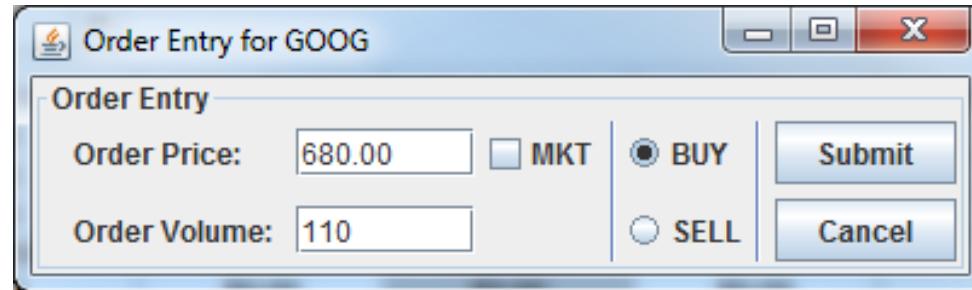


12. Both GUI's Market Displays should reflect the new GOOG current market of 250@\$680.30 – 0@0.00. (Market Width: \$-680.30)

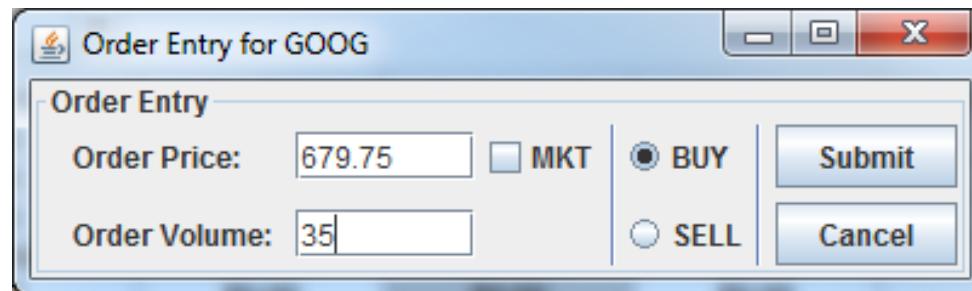
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	250	\$680.30	\$-680.30	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00
CBOE	0	\$0.00	\$0.00	\$0.00	0	
GE	0	\$0.00	\$0.00	\$0.00	0	
GOOG	250	\$680.30	\$-680.30	\$0.00	0	
IBM	0	\$0.00	\$0.00	\$0.00	0	
T	0	\$0.00	\$0.00	\$0.00	0	

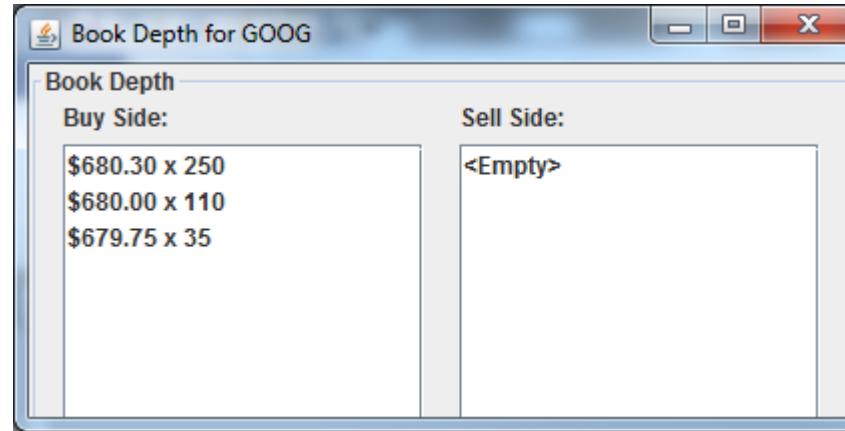
13. Enter another GOOG order using the GUI for the user with *your* name: BUY 110@680.00. Since this is not at the best Buy-Side market price, this order will not change the current market on either GUI.



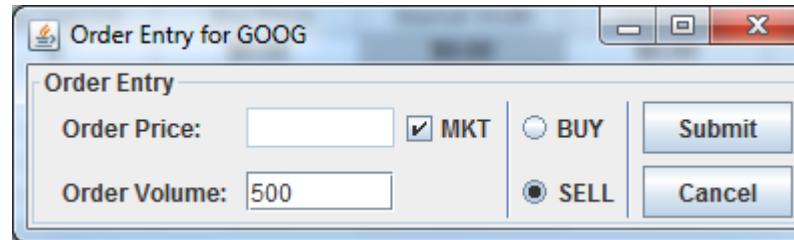
14. Once again, enter another GOOG order using the GUI for the user with *your* name: BUY 35@679.75. Since this is not at the best Buy-Side market price, this order will not change the current market on either GUI.



15. Perform a Book Depth query using the GUI for the user with *your name*. *To do this*, right click anywhere in the GOOG row in the Market Display table of the GUI with your name in it, and select pop-up menu option “Display Book Depth”. Once you have reviewed the information, close the Book Depth window.



16. Next, enter a GOOG Order using ANN’s GUI: SELL 500@MKT:



17. ANN’s Sell-Side MKT order will trade with all the entries in the Buy-Side book, and the remainder will be cancelled. Both GUI’s Market Displays should reflect the new GOOG current market of 0@0.00 – 0@0.00, and a Last Sale of 395@679.75. Both GUI’s Ticker Display should show “GOOG \$679.75”, and each GUI should display new Fill and/or Cancel Message in the Market Activity section:

YOURS (the order these appear in might be different – that's ok):

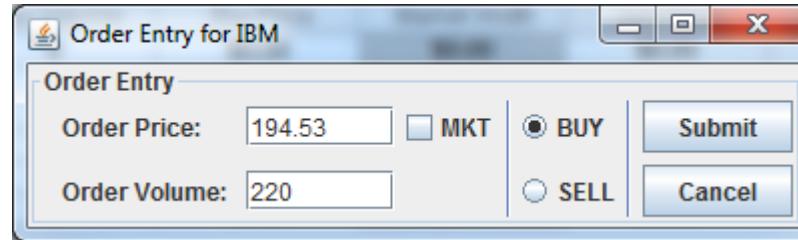
{2012-11-04 20:33:04.81} Fill Message: BUY 250 GOOG at \$680.30 leaving 0 [Tradable Id: CHRISGOOG\$680.3010742998725249]
 {2012-11-04 20:33:04.815} Fill Message: BUY 110 GOOG at \$680.00 leaving 0 [Tradable Id: CHRISGOOG\$680.0010757439988779]
 {2012-11-04 20:33:04.816} Fill Message: BUY 35 GOOG at \$679.75 leaving 0 [Tradable Id: CHRISGOOG\$679.7510769465426496]

ANNs (the order these appear in might be different – that's ok):

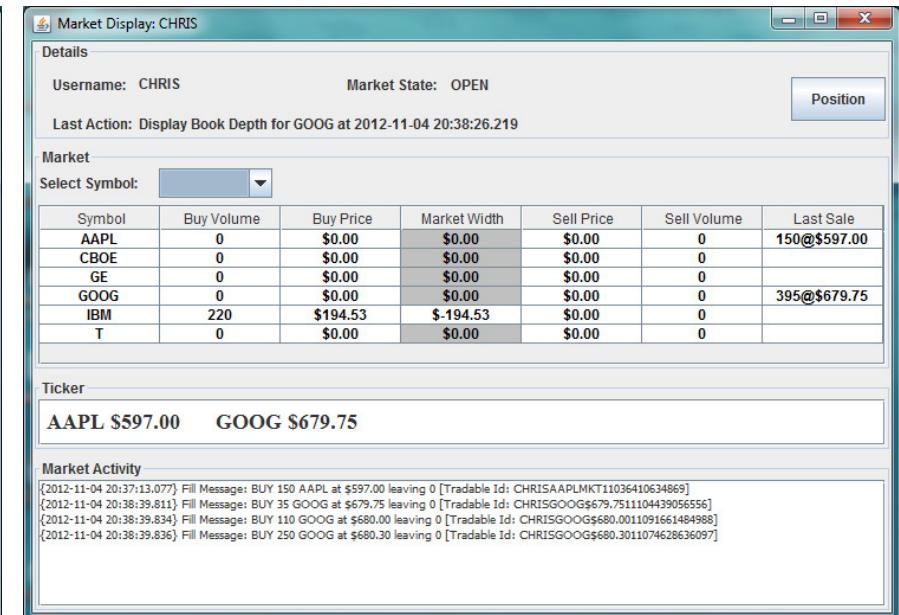
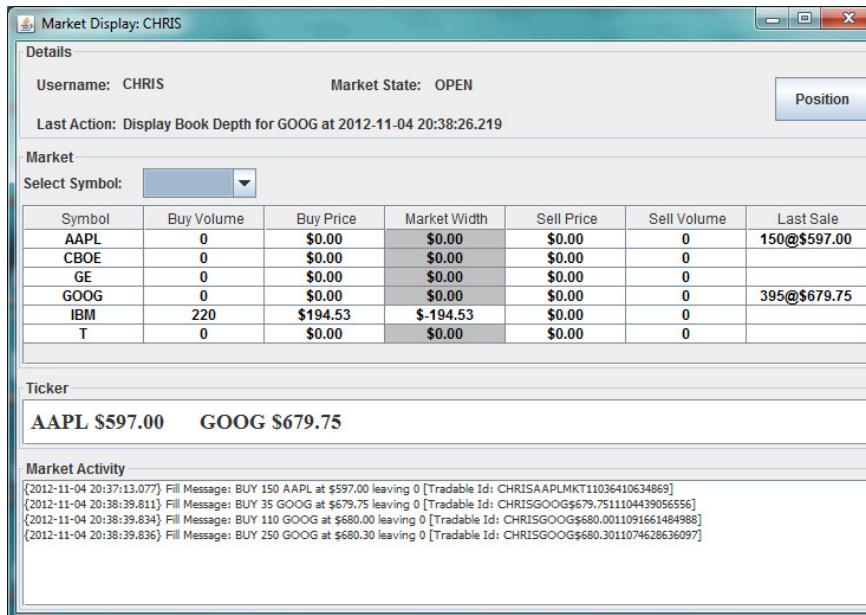
{2012-11-04 20:33:04.781} Fill Message: SELL 250 GOOG at \$680.30 leaving 250 [Tradable Id: ANNGOOGMKT10788142959406]
 {2012-11-04 20:33:04.814} Fill Message: SELL 110 GOOG at \$680.00 leaving 140 [Tradable Id: ANNGOOGMKT10788142959406]
 {2012-11-04 20:33:04.817} Fill Message: SELL 35 GOOG at \$679.75 leaving 105 [Tradable Id: ANNGOOGMKT10788142959406]
 {2012-11-04 20:33:04.828} Cancel Message: SELL 105 GOOG at MKT Cancelled [Tradable Id: ANNGOOGMKT10788142959406]

<div style="border: 1px solid #ccc; padding: 5px;"> <p>Market Display: ANN</p> <p>Details</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Username: ANN</td> <td style="width: 50%;">Market State: OPEN</td> </tr> <tr> <td colspan="2">Last Action: Enter Order for GOOG at 2012-11-04 20:38:32.74</td> </tr> </table> <p>Market</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Select Symbol: <input type="button" value="▼"/></td> </tr> <tr> <th>Symbol</th> <th>Buy Volume</th> <th>Buy Price</th> <th>Market Width</th> <th>Sell Price</th> <th>Sell Volume</th> <th>Last Sale</th> </tr> <tr> <td>AAPL</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td>150@\$597.00</td> </tr> <tr> <td>CBOE</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td></td> </tr> <tr> <td>GE</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td></td> </tr> <tr> <td>GOOG</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td>395@\$679.75</td> </tr> <tr> <td>IBM</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td></td> </tr> <tr> <td>T</td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>0</td> <td></td> </tr> </table> <p>Ticker</p> <table style="width: 100%; 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Username: ANN	Market State: OPEN																																																																																																														
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Select Symbol: <input type="button" value="▼"/>																																																																																																															
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale																																																																																																									
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00																																																																																																									
CBOE	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
GE	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
GOOG	0	\$0.00	\$0.00	\$0.00	0	395@\$679.75																																																																																																									
IBM	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
T	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
AAPL \$597.00 GOOG \$679.75																																																																																																															
Username: CHRIS	Market State: OPEN																																																																																																														
Last Action: Display Book Depth for GOOG at 2012-11-04 20:38:26.219																																																																																																															
Select Symbol: <input type="button" value="▼"/>																																																																																																															
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale																																																																																																									
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IBM	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
T	0	\$0.00	\$0.00	\$0.00	0																																																																																																										
AAPL \$597.00 GOOG \$679.75																																																																																																															

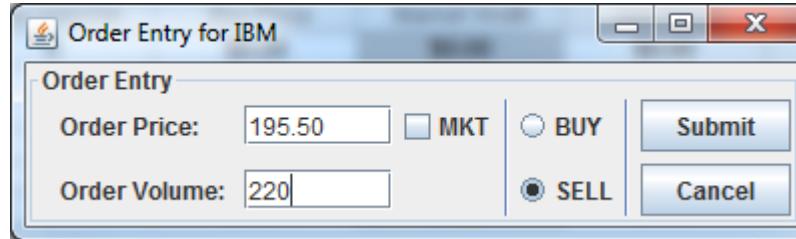
18. Now enter a IBM order using ANN's GUI: BUY 220@194.53



19. Both GUI's Market Displays should reflect the new IBM current market of 220@\$194.53 – 0@0.00. (Market Width: -\$194.53)



20. Now again enter a IBM order using ANN's GUI: SELL 220@195.50:



21. Both GUI's Market Displays should reflect the new IBM current market of 220@\$194.53 – 220@195.50. (Market Width: \$0.97)

Market Display: ANN

Details		Market State: OPEN					
Username: ANN	Last Action: Enter Order for IBM at 2012-11-04 20:42:26.153						
Market							
Select Symbol:							
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale	
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00	
CBOE	0	\$0.00	\$0.00	\$0.00	0		
GE	0	\$0.00	\$0.00	\$0.00	0		
GOOG	0	\$0.00	\$0.00	\$0.00	0	395@\$679.75	
IBM	220	\$194.53	\$0.97	\$195.50	220		
T	0	\$0.00	\$0.00	\$0.00	0		

Ticker

AAPL \$597.00 GOOG \$679.75

Market Activity

```
{2012-11-04 20:37:13.049} Fill Message: SELL 150 AAPL at $597.00 leaving 50 [Tradable Id: ANNAAPL11022339531476]
{2012-11-04 20:37:20.59} Cancel Message: BUY 200 AAPL at $594.00 Quote BUY-Side Cancelled [Tradable Id: ANNAAPL11022339460063]
{2012-11-04 20:37:20.606} Cancel Message: SELL 50 AAPL at $597.00 Quote SELL-Side Cancelled [Tradable Id: ANNAAPL11022339531476]
{2012-11-04 20:38:39.83} Fill Message: SELL 110 GOOG at $680.00 leaving 140 [Tradable Id: ANNGOOGMKT11123169050107]
{2012-11-04 20:38:39.832} Fill Message: SELL 250 GOOG at $680.30 leaving 250 [Tradable Id: ANNGOOGMKT11123169050107]
{2012-11-04 20:38:39.835} Fill Message: SELL 35 GOOG at $679.75 leaving 105 [Tradable Id: ANNGOOGMKT11123169050107]
{2012-11-04 20:38:39.84} Cancel Message: SELL 105 GOOG at MKT Cancelled [Tradable Id: ANNGOOGMKT11123169050107]
```

Market Display: CHRIS

Details		Market State: OPEN					
Username: CHRIS	Last Action: Display Book Depth for GOOG at 2012-11-04 20:38:26.219						
Market							
Select Symbol:							
Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale	
AAPL	0	\$0.00	\$0.00	\$0.00	0	150@\$597.00	
CBOE	0	\$0.00	\$0.00	\$0.00	0		
GE	0	\$0.00	\$0.00	\$0.00	0		
GOOG	0	\$0.00	\$0.00	\$0.00	0	395@\$679.75	
IBM	220	\$194.53	\$0.97	\$195.50	220		
T	0	\$0.00	\$0.00	\$0.00	0		

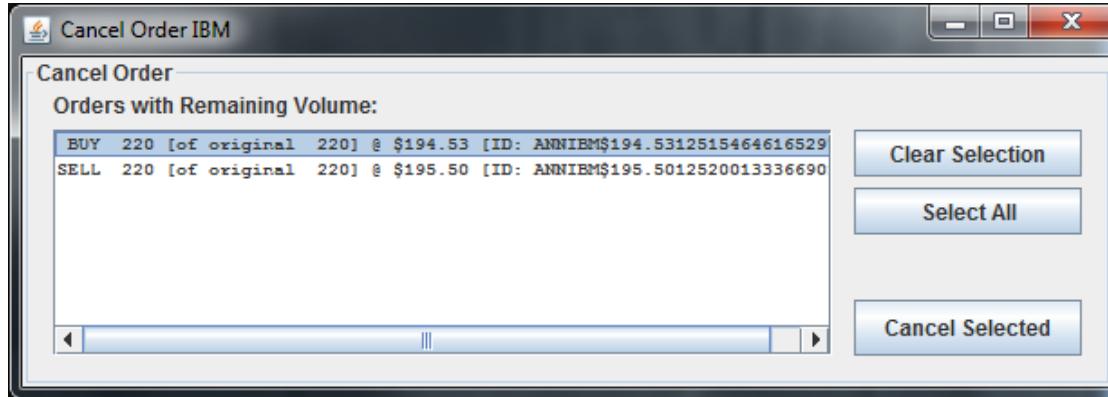
Ticker

AAPL \$597.00 GOOG \$679.75

Market Activity

```
{2012-11-04 20:37:13.077} Fill Message: BUY 150 AAPL at $597.00 leaving 0 [Tradable Id: CHRISAPLMT11036410634869]
{2012-11-04 20:38:39.811} Fill Message: BUY 35 GOOG at $679.75 leaving 0 [Tradable Id: CHRISGOOG$679.751104439056556]
{2012-11-04 20:38:39.834} Fill Message: BUY 110 GOOG at $680.00 leaving 0 [Tradable Id: CHRISGOOG$680.0011091661484988]
{2012-11-04 20:38:39.836} Fill Message: BUY 250 GOOG at $680.30 leaving 0 [Tradable Id: CHRISGOOG$680.3011074628636097]
```

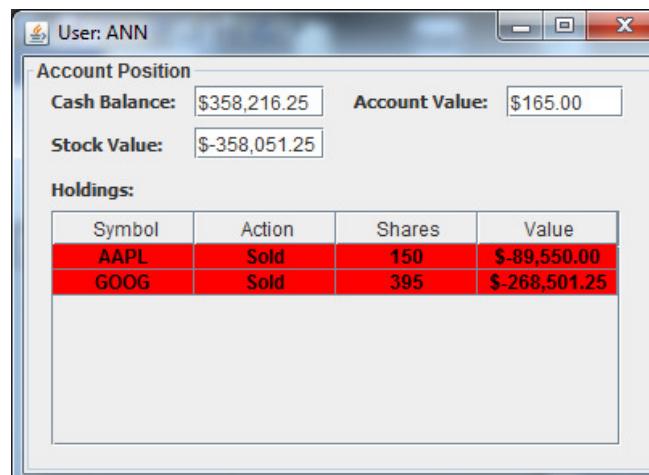
22. Now cancel an order using ANN's GUI. *To do this*, right click anywhere in the IBM row in the Market Display table of ANN's GUI, and select pop-up menu option "Cancel Order". Select the *BUY* order (buy left-clicking on it) and click the "Cancel Selected" button.



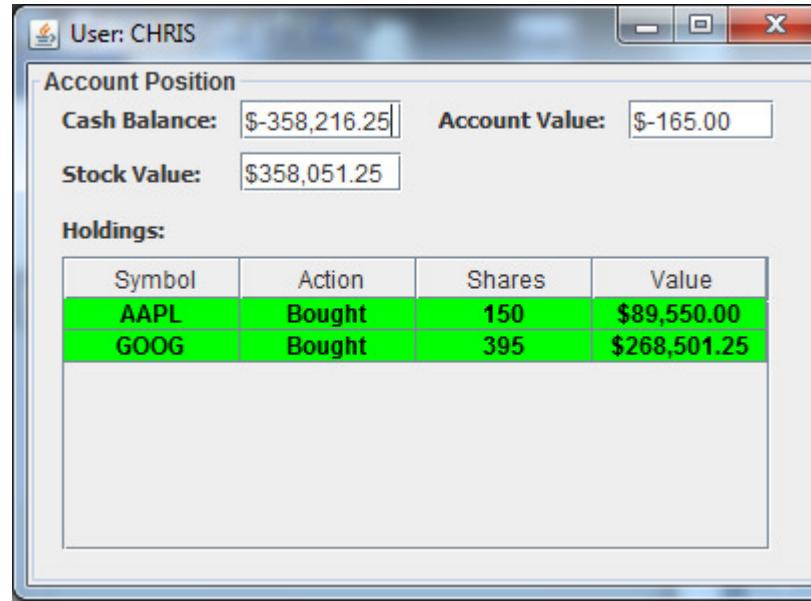
23. Both GUI's Market Displays should reflect the new IBM current market of 0@0.00 – 220@195.50 (Market Width: \$195.50). ANN's GUI should display a new Cancel Message in the Market Activity section:

{2012-10-31 16:03:10.885} Cancel Message: BUY 220 IBM at \$194.53 BUY Order Cancelled [Tradable Id: ANNIBM\$194.531251546461652971]

24. Click the "Position" button on the upper-right on ANN's GUI to display her current position. Close ANN's position window when done.



25. Now click the “Position” button on the upper-right on the GUI with *your name* in it to display your current position:



26. Next, enter an AAPL order using the GUI with *your name* in it: BUY 100@MKT. Since there is not enough sell-side interest to fill this Buy-side market order, the entire order is immediately cancelled:

YOURS: {2012-10-31 16:07:16.432} Cancel Message: BUY 100 AAPL at MKT Cancelled [Tradable Id: CHRISAAPLMKT1252392741570282]

27. Now, enter an AAPL order using the GUI with your name in it: BUY 100@600.00. Both GUI's Market Displays should reflect the new AAPL current market of 100@600.00 – 0@0.00. (Market Width: \$-600.00)

28. Enter an AAPL order using ANN's GUI: SELL 100@MKT. That Sell-side MKT order trades with the Buy-side. Both GUI's Market Displays should reflect the new AAPL current market of 0@0.00 – 0@0.00 and a Last Sale of 100@\$600.00. Both GUI's Ticker Display should show "AAPL \$600.00↑", and each GUI should display a Fill Message in the Market Activity section:

YOURS: {2012-10-31 16:10:31.632} Fill Message: BUY 100 AAPL at \$600.00 leaving 0 [Tradable Id: CHRISAAPL\$600.001252517469732473]

ANNS: {2012-10-31 16:10:31.632} Fill Message: SELL 100 AAPL at \$600.00 leaving 0 [Tradable Id: ANNAAPLMKT1252587933549679]

29. Again, click the “Position” button on the upper-right on the both GUIs to display the current position:

User: CHRIS

Account Position			
Cash Balance:	\$-418,216.25	Account Value:	\$285.00
Stock Value:	\$418,501.25		
Holdings:			
Symbol	Action	Shares	Value
AAPL	Bought	250	\$150,000.00
GOOG	Bought	395	\$268,501.25

User: ANN

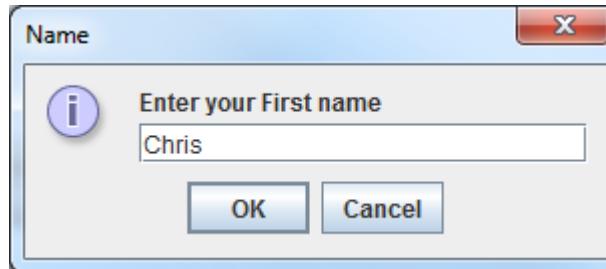
Account Position			
Cash Balance:	\$418,216.25	Account Value:	\$-285.00
Stock Value:	\$-418,501.25		
Holdings:			
Symbol	Action	Shares	Value
AAPL	Sold	250	\$-150,000.00
GOOG	Sold	395	\$-268,501.25

30. Done with Part1

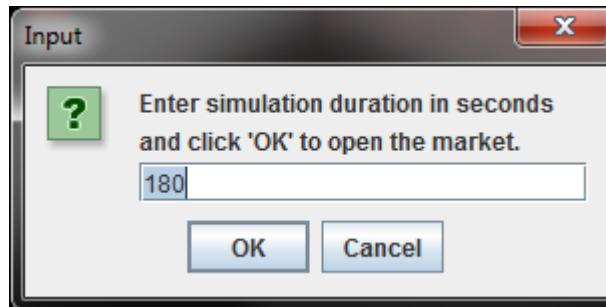
Phase 6 Automated Testing.

The Automated Test is actually a simulation where 5 simulated traders (they will not have GUI's) will connect to the system and perform trading activity. You may monitor this activity using a Market Display window as described below. The point of this test is to monitor the output of the application for unusual messages or exceptions.

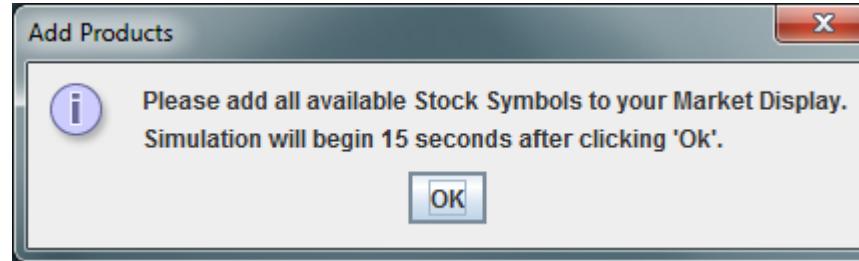
1. Run the “*MainAutomatedTest*” driver to start the automated test. This will first ask for your first name. Enter a name and click “OK”:



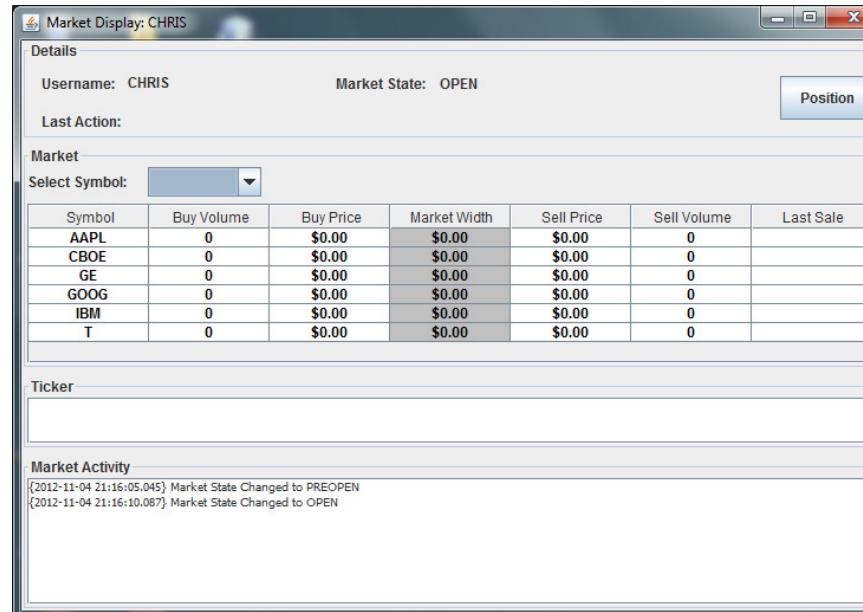
2. A Market Display GUI will be displayed for the name you specified. In addition, you will see a pop-up window that asks you to enter the simulation duration in seconds. You can use the “180” default value that is present, or you can use a shorter or longer time if you desire. Click OK on the pop-up window.



3. Another pop-up window will now be displayed as can be seen below. The simulated stock traders will begin activity 15 seconds after you click OK on this pop-up.



4. After you click "OK" on the pop-up window, go to the displayed Market Display GUI and add all available stock symbols to the market displays (there are 6 of them). *Do this like you did at the beginning of the manual tests.*



5. After a few seconds the market will change to the PREOPEN state. A few seconds after that it will change to the OPEN state. A few seconds after that, the simulated traders will begin their activity:



6. The activity of the simulated traders is randomly generated so there is nothing in particular that you need to look at in order to verify the application's operation. You should review the system output to see if you see any errors or exceptions there indicating that something is not running properly. The output the driver should generate is:

Simulation starting in 15 seconds...

Simulation starting in 10 seconds...

Simulation starting in 5 seconds...

Simulation starting: 600 seconds remain.

Simulated user 'SIM1' starting trading activity - 600 second duration.

Simulated user 'SIM4' starting trading activity - 600 second duration.

Simulated user 'SIM5' starting trading activity - 600 second duration.

Simulated user 'SIM2' starting trading activity - 600 second duration.

Simulated user 'SIM3' starting trading activity - 600 second duration.

7. You can interact with the stock markets at any time while the simulated traders are performing activity. You should see fills, cancels, etc in your own Market Display window, reflecting any activity you perform:

Market Display: CHRIS

Details

Username: CHRIS	Market State: OPEN	Position
-----------------	--------------------	-----------------

Last Action: Enter Order for GOOG at 2012-11-04 21:20:56.381

Market

Select Symbol: ▾

Symbol	Buy Volume	Buy Price	Market Width	Sell Price	Sell Volume	Last Sale
AAPL	405	\$593.70	\$6.69	\$600.39	351	354@\$574.74
CBOE	217	\$28.80	\$0.01	\$28.81	321	45@\$27.94
GE	102	\$19.20	\$0.27	\$19.47	109	1@\$19.74
GOOG	113	\$590.75	\$9.73	\$600.48	2	543@\$597.23
IBM	85	\$188.75	\$0.01	\$188.76	237	162@\$187.83
T	6	\$33.63	\$0.01	\$33.64	158	245@\$33.63

Ticker

GE \$19.74↓ GE \$19.74= T \$33.63↓ IBM \$187.82↑ IBM \$187.83↑

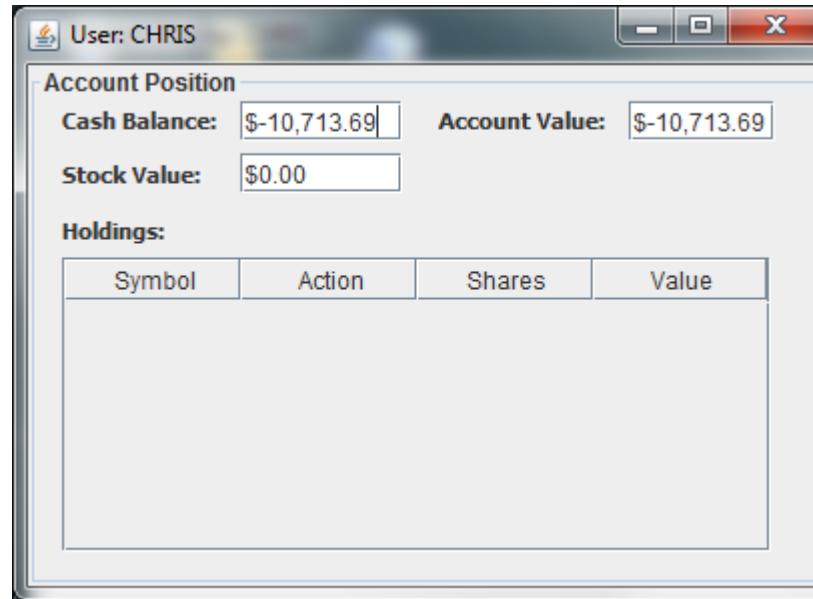
Market Activity

```

{2012-11-04 21:20:07.774} Fill Message: BUY 60 GOOG at $624.26 leaving 0 [Tradable Id: CHRISGOOGMKT13611077980890]
{2012-11-04 21:20:07.774} Fill Message: BUY 40 GOOG at $619.57 leaving 60 [Tradable Id: CHRISGOOGMKT13611077980890]
{2012-11-04 21:20:36.751} Cancel Message: BUY 500 AAPL at $580.00 Quote BUY-Side Cancelled [Tradable Id: CHRISAPPL13634122641218]
{2012-11-04 21:20:36.767} Cancel Message: SELL 500 AAPL at $600.00 Quote SELL-Side Cancelled [Tradable Id: CHRISAPPL13634122649343]
{2012-11-04 21:20:51.763} Fill Message: BUY 467 GOOG at $607.62 leaving 33 [Tradable Id: CHRISGOOGMKT13655069237236]
{2012-11-04 21:20:51.763} Cancel Message: BUY 33 GOOG at MKT Cancelled [Tradable Id: CHRISGOOGMKT13655069237236]
{2012-11-04 21:21:02.698} Fill Message: SELL 467 GOOG at $590.75 leaving 0 [Tradable Id: CHRISGOOGMKT13665998915969]

```

8. You can also then check the Position after interacting with the simulated stock market. For example, aftr some time passed while interacting with the markets, it might look like the below. After trading, the account has lost over \$10,000. Not a good trading day!



9. Once the simulation time expires, the market will go into the CLOSED state, and you will see the following pop-up. At this point, the automated test is complete!

