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Appendix A

DETAILED TEST RESULTS

1. **Putting a new order (Order type :- Limit)**

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
1q2yu4	100	12.500000			

Table A.1: Putting a limit new order

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

Order ID: 1q2yu4 Order Size : 100 Order Price : 12.5
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.1: Automated test result for test case in Table 5.1

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 1 ++++++++++++
2017-12-02.18:27:54:    Order ID: 1q2yu4 | Size : 100 | Price : 12.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.2: Actual result extracted from log file for test case in Table 5.1

2. **Putting another new order with higher priority(Order type :- Limit)**

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
2t6as8	200	13.700000			
1q2yu4	100	12.500000			

Table A.2: Putting limit new order with higher priority

```
++++++++++++ Order Book of l0YR_CR02 Side : 1 ++++++++++++

Order ID: 2t6as8 Order Size : 200 Order Price : 13.7
Order ID: 1q2yu4 Order Size : 100 Order Price : 12.5
++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of l0YR_CR02 Side : 2 ++++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.3: Automated test result for test case in Table 5.2

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 1 ++++++++++++
2017-12-02.18:27:54:    Order ID: 2t6as8 | Size : 200 | Price : 13.700000
2017-12-02.18:27:54:    Order ID: 1q2yu4 | Size : 100 | Price : 12.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.4: Actual result extracted from log file for test case in Table 5.2

3. **Partial match with previous order**

   Here we put a sell order for the same instrument with size 100 and price 13.5 .

   The resulting order book should have following figures.

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
2t6as8	100	13.700000			
1q2yu4	100	12.500000			

Table A.3: Putting sell order for partial match

```
++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++

Order ID: 2t6as8 Order Size : 100 Order Price : 13.7
Order ID: 1q2yu4 Order Size : 100 Order Price : 12.5
++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.5: Automated test result for test case in Table 5.3

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 1 ++++++++++++
2017-12-02.18:27:54:    Order ID: 2t6as8 | Size : 100 | Price : 13.700000
2017-12-02.18:27:54:    Order ID: 1q2yu4 | Size : 100 | Price : 12.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.6: Actual result extracted from log file for test case in Table 5.3

4. **Fully match with previous order**

   Now we put a sell order with size of 150 at a price of 11.5 and the resulting order book should have following figures

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
1q2yu4	50	12.500000			

Table A.4: Putting a sell order for full match

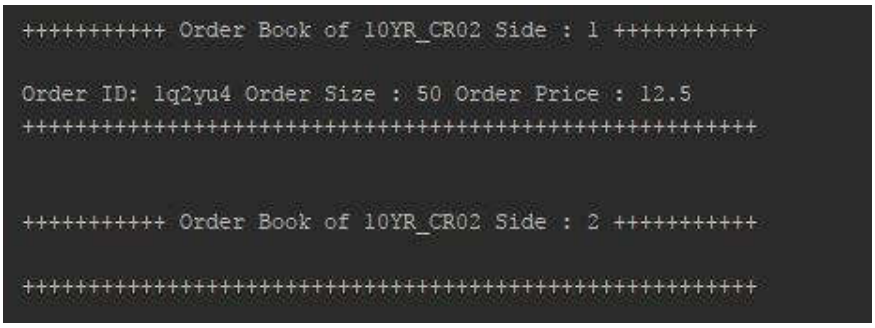

Figure A.7: Automated test result for test case in Table 5.4

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 1 ++++++++++++
2017-12-02.18:27:54:    Order ID: 1q2yu4 | Size : 50 | Price : 12.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.8: Actual result extracted from log file for test case in Table 5.4

5. **Full match with add to book**

   Here we can test a full match of a order in its counter order book side and the remaining quantity being added to the respective side. An order having size of 200 is put at a price of 11.75. Resulting orderbook can be seen as per table 5.5.

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			11.750000	150	5y9ew6

Table A.5: Putting a sell order for full match and adding remaining quantity to order book

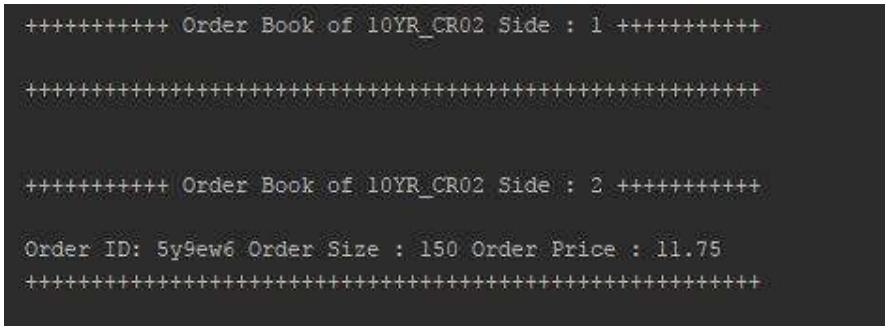

Figure A.9: Automated test result for test case in Table 5.5

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++
2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.10: Actual result extracted from log file for test case in Table 5.5

6. **Putting a sell order with a higher priority**

   Here an order is placed which is a sell order. The order has a higher priority than exisiting orders in the current order book.

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			10.250000	100	6q7ui7
			11.750000	150	5y9ew6

Table A.6: Putting a sell order with a higher priority

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

Order ID: 6q7ui7 Order Size : 100 Order Price : 10.25
Order ID: 5y9ew6 Order Size : 150 Order Price : 11.75
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.11: Automated test result for test case in Table 5.6

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++

2017-12-02.18:27:54:    Order ID: 6q7ui7 | Size : 100 | Price : 10.250000

2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000

2017-12-02.18:27:54:    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.12: Actual result extracted from log file for test case in Table 5.6

7. **Amending the previous order (Without losing priority)**

   Now we amend order 6q7ui7 changing its price to 9.5

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			9.500000	100	6q7ui7
			11.750000	150	5y9ew6

Table A.7: Order amend without losing priority

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

Order ID: 6q7ui7 Order Size : 100 Order Price : 9.5
Order ID: 5y9ew6 Order Size : 150 Order Price : 11.75
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.13: Automated test result for test case in Table 5.7

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++
2017-12-02.18:27:54:    Order ID: 6q7ui7 | Size : 100 | Price : 9.500000
2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.14: Actual result extracted from log file for test case in Table 5.7

8. **Amending the previous order (Loosing priority)**

   Now the price of the same order is increased in such a way that its priority is reduced

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			11.750000	150	5y9ew6
			15.500000	100	6q7ui7

Table A.8: Order amend while losing priority

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

Order ID: 5y9ew6 Order Size : 150 Order Price : 11.75
Order ID: 6q7ui7 Order Size : 100 Order Price : 15.5
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.15: Automated test result for test case in Table 5.8

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++
2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000
2017-12-02.18:27:54:    Order ID: 6q7ui7 | Size : 100 | Price : 15.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.16: Actual result extracted from log file for test case in Table 5.8

9. **Put a buy market order**

Now a market order feature is tested and put in size of 100 which priced at 10

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			11.750000	150	5y9ew6
			15.500000	100	6q7ui7

Table A.9: Market order with expiry

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

Order ID: 5y9ew6 Order Size : 150 Order Price : 11.75
Order ID: 6q7ui7 Order Size : 100 Order Price : 15.5
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.17: Automated test result for test case in Table 5.9

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++
2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000
2017-12-02.18:27:54:    Order ID: 6q7ui7 | Size : 100 | Price : 15.500000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.18: Actual result extracted from log file for test case in Table 5.9

10. **Order cancellation**

Now order 6q7ui7 is canceled and following should be the outcome

Order Book					
Buy Side			Sell Side		
Order ID	Size	Price	Price	Size	Order ID
			11.750000	150	5y9ew6

Table A.10: Order cancellation

```
++++++++++++ Order Book of 10YR_CR02 Side : 1 ++++++++++++

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


++++++++++++ Order Book of 10YR_CR02 Side : 2 ++++++++++++

Order ID: 5y9ew6 Order Size : 150 Order Price : 11.75
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.19: Automated test result for test case in Table 5.10

```
2017-12-02.18:27:54:    ++++++++++++ Order Book of Instrument: 23 Side : 2 ++++++++++++
2017-12-02.18:27:54:    Order ID: 5y9ew6 | Size : 150 | Price : 11.750000
2017-12-02.18:27:54:    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Figure A.20: Actual result extracted from log file for test case in Table 5.10