# Q-Book Quick Start Guide

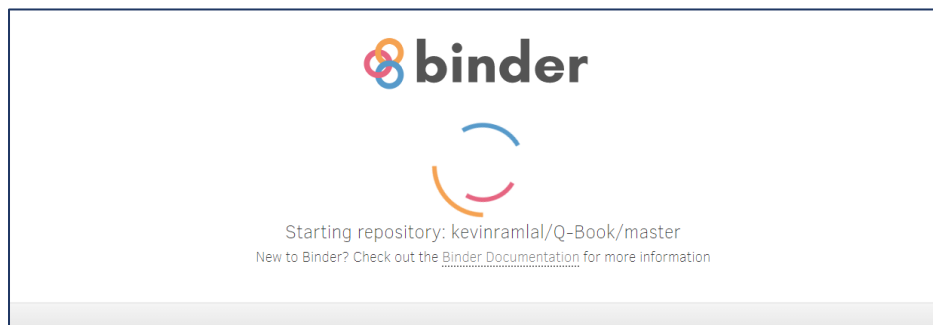## Contents

1. Launching Q-Book



Kevin Ramlal Homepage

### Overview

Q-Book is a python based limit order book simulator designed to showcase the basic functionality of real-world limit order books. Using a GUI, users can experiment with different settings for market orders, limit orders, cancellations, as well as see a market-making algorithm in action!

### Launch Q-Book

Opens up a Binder containing QBook Jupyter Notebook. For instructions on usage see *Q-Book Quickstart Guide*. Note this may take a few minutes if it's the first time launching!

- Click "Launch Q-Book" link in the Q-Book homepage. This will bring up a *Binder* containing a Jupyter notebook. If it is your first time running the Binder, it may take a few minutes to build. Upon clicking the link, you should see a page like this:



Starting repository: kevinramlal/Q-Book/master
New to Binder? Check out the Binder Documentation for more information

- After a few moments, the Jupyter Notebook should appear as this:



```
In [1]:  ▶ from qbook import *
           QBook_GUI()

           VBox(children=(VBox(children=(Button(button_style='danger', description='Generate Q Book', style=ButtonStyle(b…
```

- Click on the first code cell where it says *"from qbook import ..."* (you know you've selected the cell when it is outlined in green).

- Hit **SHIFT+Enter** at the same time to **run** the cell.

- After a few moments, the following should appear:



- This is the Q-Book GUI, initialized with the default settings.

## 2. Adjusting Settings in Q-Book

- Using the Settings "Panel" displayed at the top the Q-Book GUI, we can adjust several features of Q-Book, such as the rate of order and cancellation arrivals, as well as the volume per order. We can also switch on/off the market making algo, which is discussed in the next section.



- Q-Book is launched with the default settings above. Suppose now we wanted there to be a total of 45 time-steps instead of the default 30. We can type this in directly in the *Time* setting's box. Likewise, we can edit any of the setting boxes we see.

- Once new settings have been typed into their respective boxes, we need to **Re-Generate Q-Book by hitting the "Generate Q-Book" button.**



- By Changing the Time setting and regenerating Q-Book, we now see there are 45 time-steps.



| Level | Bid_Vol | Bid Total | Bids | Asks | Ask Total | Ask_Vols |
|---|---|---|---|---|---|---|
| 1 | {} | 0 | 99.99 | 100.01 | 0 | {} |
| 2 | {2009: 50} | 50 | 99.98 | 100.02 | 0 | {} |
| 3 | {} | 0 | 99.97 | 100.03 | 0 | {} |
| 4 | {} | 0 | 99.96 | 100.04 | 0 | {} |
| 5 | {} | 0 | 99.95 | 100.05 | 0 | {} |
| 6 | {} | 0 | 99.94 | 100.06 | 50 | {-6006: 50} |
| 7 | {} | 0 | 99.93 | 100.07 | 50 | {-7004: 50} |
| 8 | {} | 0 | 99.92 | 100.08 | 0 | {} |
| 9 | {} | 0 | 99.91 | 100.09 | 0 | {} |
| 10 | {} | 0 | 99.90 | 100.10 | 25 | {-10005: 25} |

## 3. Activating Market Maker Algo

- Using the **default settings** upon Q-Book launch, the market maker is **disabled**, as shown in the *Market Maker* tab at the bottom.

| Message Log | Mid Price Graph | Market Maker |
|---|---|---|

Time Step: ——————O    45

Market Maker Program Not Activated
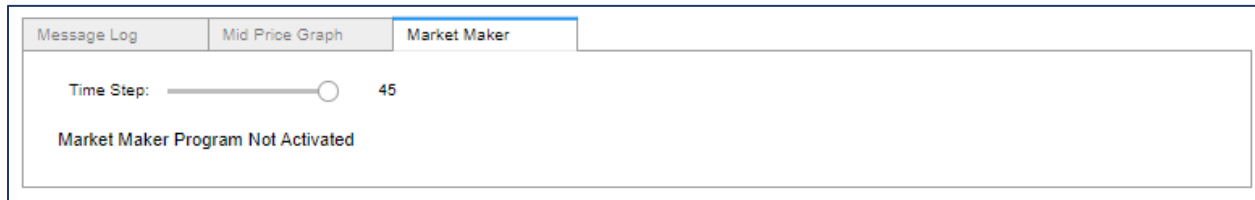
- To **activate the Market Maker, click the Market Maker checkbox** in **the Settings Panel**, and Re-Generate Q-Book.

**Generate Q Book**

| **Time Steps** | **Market Settings** | **Limit Settings** | **Cancel Settings** |
|---|---|---|---|
| Time:  30 | Order/Sec:  4 | Order/Sec:  2 | Order/Sec:  2 |
| ☑ Market Maker | Vol/Order:  20 | Vol/Order:  50 | |
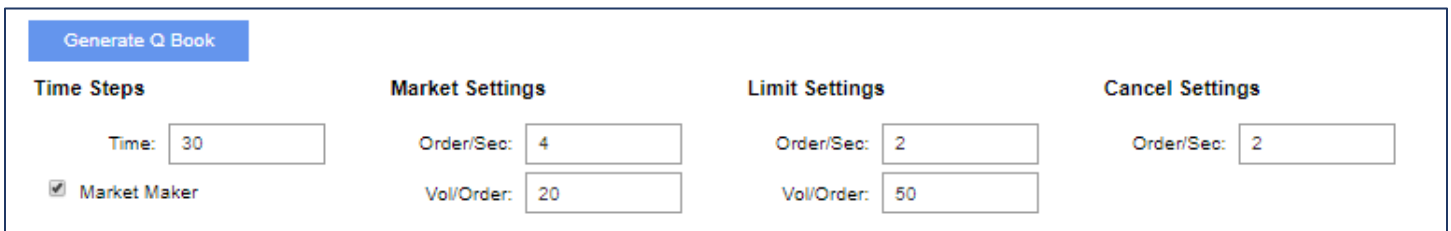
- The Market Maker Tab will now show activity.

| Message Log | Mid Price Graph | Market Maker |
|---|---|---|

Time Step: ———————●    29

Market Maker Inventory : -50
Number of Full Closures:  14
Market Maker $ Profit : $ 7.0

MM Profit