

EXAMPLE: How to build a dYdX Orderbook

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Tested on: Ubuntu Server 20.04.4 LTS

We will build the dYdX orderbook with 3 programs:

- 1) dydxob.py (the orderbook builder).
- 2) dydxtrades (the last-trade monitor), and
- 3) dydxob2.py (the orderbook displayer)

All programs are available at <https://github.com/chiwalfm/dydxexamples>

PART 1: dydxob.py

1. First, create a 1GB ramdisk and mount it as /mnt/ramdisk/ as this program will write a LOT of files continuously. Also create two folders asks/ and bids/ on the ramdisk.

```
$ sudo mount -t tmpfs -o rw,size=1G tmpfs /mnt/ramdisk
$ sudo chmod 777 /mnt/ramdisk
$ mkdir /mnt/ramdisk/asks /mnt/ramdisk/bids
```

2. Next, start the dydxob.py program. Note that this creates 'price' files in the directories asks/ and bids/. These price files contain two elements: the 'size' at that price, and the 'offset' of the price. The -u option to python tells python not to buffer

-u Force the stdout and stderr streams to be unbuffered. This option has no effect on the stdin stream.

```
$ nohup python3 -u dydxob.py > /mnt/ramdisk/dydxob.log 2>&1 &
```

3. The program will now run continuously updating order book prices, sizes, and offsets. Note that the log file /tmp/ramdisk/dydxob.log can get extremely large and will need truncation every so often. You can do this with the command:

```
$ cat /dev/null > /mnt/ramdisk/dydxob.log
```

PART 2: dydxtrades.py

1. Start the dydxtrades.py program. Note that this constantly updates the file /mnt/ramdisk/lasttrade with the price and side (BUY or SELL) of the last trade.

```
$ nohup python3 -u dydxtrades.py > /mnt/ramdisk/dydxtrades.log 2>&1 &
```

2. The program will now run continuously updating the lasttrade price and side.

PART 3: dydxob2.py

1. Finally, start the dydxob2.py program. This will display and continuously update the order book on your screen.

```
$ python3 -u dydxob2.py
```

```
vmware@ubuntu20041a: ~/extra
Bid
42728 (0.0356) 12134348167 2022-04-08 14:40:20 | 42733 (2.0726) 12134360158 2022-04-08 14:40:27
42727 (0.0366) 12134350539 2022-04-08 14:40:22 | 42733 (0.7132) 12134360409 2022-04-08 14:40:27
42719 (0.7894) 12134360175 2022-04-08 14:40:27 | 42734 (0.5137) 12134360272 2022-04-08 14:40:27
42718 (0.7894) 12134360413 2022-04-08 14:40:27 | 42736 (0.48) 12134360245 2022-04-08 14:40:27
42712 (0.7899) 12134360372 2022-04-08 14:40:27 | 42738 (0.75) 12134358107 2022-04-08 14:40:26
42705 (1.2524) 12134360433 2022-04-08 14:40:27 | 42749 (0.5453) 12134359290 2022-04-08 14:40:27
42704 (1.2543) 12134359985 2022-04-08 14:40:27 | 42750 (0.5493) 12134360062 2022-04-08 14:40:27
42702 (0.4446) 12134360283 2022-04-08 14:40:27 | 42751 (1.2) 12134360277 2022-04-08 14:40:27
42701 (0.8957) 12134358289 2022-04-08 14:40:26 | 42753 (0.2807) 12134359696 2022-04-08 14:40:27
42700 (0.05) 12134359133 2022-04-08 14:40:27 | 42754 (0.2339) 12134360116 2022-04-08 14:40:27
2022-04-08 14:40:28 Last trade: 2022-04-08T19:40:28.575Z 42737 BUY (0.15)
Ask
42731 (0.7743) 12134362485 2022-04-08 14:40:28 | 42738 (0.75) 12134358107 2022-04-08 14:40:26
42728 (0.0356) 12134348167 2022-04-08 14:40:20 | 42744 (0.03) 12134360755 2022-04-08 14:40:28
42727 (0.0366) 12134350539 2022-04-08 14:40:22 | 42749 (0.9253) 12134359290 2022-04-08 14:40:27
42723 (0.55) 12134361212 2022-04-08 14:40:28 | 42750 (0.8979) 12134360655 2022-04-08 14:40:27
42722 (0.9253) 12134362474 2022-04-08 14:40:28 | 42751 (0.75) 12134360666 2022-04-08 14:40:27
42721 (1.6273) 12134362511 2022-04-08 14:40:28 | 42752 (0.75) 12134360869 2022-04-08 14:40:28
42719 (1.5434) 12134361352 2022-04-08 14:40:28 | 42753 (1.0307) 12134361053 2022-04-08 14:40:28
42717 (1.52) 12134361799 2022-04-08 14:40:28 | 42754 (0.2339) 12134360116 2022-04-08 14:40:27
42713 (1.1849) 12134362558 2022-04-08 14:40:28 | 42755 (0.2339) 12134360290 2022-04-08 14:40:27
42706 (2.0017) 12134362634 2022-04-08 14:40:28 | 42756 (0.9253) 12134359223 2022-04-08 14:40:27
2022-04-08 14:40:29 Last trade: 2022-04-08T19:40:29.886Z 42739 BUY (0.117)
Ask
42731 (0.4566) 12134364350 2022-04-08 14:40:29 | 42743 (3.2462) 12134363741 2022-04-08 14:40:29
42728 (0.7894) 12134364049 2022-04-08 14:40:29 | 42749 (0.45) 12134364266 2022-04-08 14:40:29
42727 (1.3959) 12134364172 2022-04-08 14:40:29 | 42751 (0.9335) 12134364047 2022-04-08 14:40:29
42723 (0.55) 12134364373 2022-04-08 14:40:29 | 42752 (0.75) 12134360866 2022-04-08 14:40:28
42722 (1.3059) 12134364159 2022-04-08 14:40:29 | 42753 (6.026) 12134364125 2022-04-08 14:40:29
42721 (2.5526) 12134362733 2022-04-08 14:40:28 | 42762 (0.9253) 12134364052 2022-04-08 14:40:29
42719 (1.5434) 12134363973 2022-04-08 14:40:29 | 42764 (0.8957) 12134359275 2022-04-08 14:40:27
42718 (0.1288) 12134364380 2022-04-08 14:40:29 | 42766 (1.0042) 12134362971 2022-04-08 14:40:29
42717 (1.2394) 12134364062 2022-04-08 14:40:29 | 42767 (0.5872) 12134362957 2022-04-08 14:40:29
42713 (0.4682) 12134364039 2022-04-08 14:40:29 | 42768 (0.2522) 12134364129 2022-04-08 14:40:29
2022-04-08 14:40:30 Last trade: 2022-04-08T19:40:30.928Z 42738 SELL (0.11)
Ask
42736 (3.5228) 12134366124 2022-04-08 14:40:30 | 42741 (0.7894) 12134366264 2022-04-08 14:40:30
42736 (1.9777) 12134365718 2022-04-08 14:40:30 | 42742 (0.7894) 12134366424 2022-04-08 14:40:30
42733 (0.9253) 12134365504 2022-04-08 14:40:30 | 42743 (0.5607) 12134366419 2022-04-08 14:40:30
42732 (5.8054) 12134365469 2022-04-08 14:40:30 | 42744 (1.8918) 12134366463 2022-04-08 14:40:30
42727 (0.9253) 12134365759 2022-04-08 14:40:30 | 42747 (1.2577) 12134365909 2022-04-08 14:40:30
42724 (0.4682) 12134366039 2022-04-08 14:40:30 | 42751 (0.1835) 12134365166 2022-04-08 14:40:30
42723 (0.4682) 12134366364 2022-04-08 14:40:30 | 42753 (5.276) 12134365107 2022-04-08 14:40:30
42722 (0.1) 12134365655 2022-04-08 14:40:30 | 42754 (0.6668) 12134366409 2022-04-08 14:40:30
42721 (5.018) 12134365546 2022-04-08 14:40:30 | 42755 (0.03) 12134366450 2022-04-08 14:40:30
42715 (0.281) 12134366003 2022-04-08 14:40:30 | 42758 (4.509) 12134366417 2022-04-08 14:40:30
2022-04-08 14:40:32 Last trade: 2022-04-08T19:40:31.823Z 42736 SELL (0.251)
Ask
42727 (0.7753) 12134368078 2022-04-08 14:40:31 | 42737 (0.9253) 12134367912 2022-04-08 14:40:31
42722 (0.1) 12134365655 2022-04-08 14:40:30 | 42739 (1.1318) 12134368067 2022-04-08 14:40:31
42721 (0.117) 12134367341 2022-04-08 14:40:31 | 42740 (3.1143) 12134368239 2022-04-08 14:40:31
42718 (0.1599) 12134368086 2022-04-08 14:40:31 | 42741 (1.2136) 12134367885 2022-04-08 14:40:31
42713 (0.4982) 12134368236 2022-04-08 14:40:31 | 42742 (0.55) 12134367268 2022-04-08 14:40:31
42712 (3.2461) 12134367186 2022-04-08 14:40:31 | 42744 (0.15) 12134368032 2022-04-08 14:40:31
42711 (0.1288) 12134367827 2022-04-08 14:40:31 | 42746 (2.9105) 12134368167 2022-04-08 14:40:31
42710 (1.2529) 12134367010 2022-04-08 14:40:31 | 42749 (0.55) 12134367566 2022-04-08 14:40:31
42709 (0.543) 12134367397 2022-04-08 14:40:31 | 42750 (0.2808) 12134367237 2022-04-08 14:40:31
42706 (2.0017) 12134367905 2022-04-08 14:40:31 | 42751 (0.1835) 12134366825 2022-04-08 14:40:31
```

1. Colored entries indicate when the last-traded price matches with bid/ask.

a) bid (left) or ask (right) price

b) size

c) offset number

d) date and time of that price