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/chiwalfrm/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.

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$ python3 -u dydxob2.py
2022-04-08 08:48:14 Last trade:  2022-04-08T13:48:13.894Z 42952 BUY (0.0596)
Bid                                          | Ask
42951 (1.8047)    12108821218 2022-04-08 08:48:14 | 42952 (0.2141)    12108820995 2022-04-08 08:48:13
42950 (0.7894)    12108821147 2022-04-08 08:48:14 | 42954 (0.1164)    12108821064 2022-04-08 08:48:13
42949 (0.7894)    12108821060 2022-04-08 08:48:13 | 42958 (2.0017)    12108820585 2022-04-08 08:48:13
42948 (0.7894)    12108820647 2022-04-08 08:48:13 | 42959 (1.7246)    12108820297 2022-04-08 08:48:13
42947 (5.1967)    12108820560 2022-04-08 08:48:13 | 42960 (0.0115)    12108820389 2022-04-08 08:48:13
42946 (0.2862)    12108821034 2022-04-08 08:48:13 | 42961 (0.1047)    12108820829 2022-04-08 08:48:13
42945 (0.5248)    12108821054 2022-04-08 08:48:13 | 42962 (6.9228)    12108820779 2022-04-08 08:48:13
42942 (0.101)     12108820178 2022-04-08 08:48:13 | 42963 (0.4826)    12108820713 2022-04-08 08:48:13
42941 (0.3498)    12108821175 2022-04-08 08:48:14 | 42965 (0.0468)    12108814742 2022-04-08 08:48:08
42940 (1.8228)    12108821130 2022-04-08 08:48:14 | 42967 (0.8975)    12108821161 2022-04-08 08:48:14
2022-04-08 08:48:15 Last trade:  2022-04-08T13:48:14.994Z 42946 SELL (0.02)
Bid                                          | Ask
42946 (4.1343)    12108823415 2022-04-08 08:48:15 | 42947 (0.1181)    12108823390 2022-04-08 08:48:15
42945 (1.5788)    12108822955 2022-04-08 08:48:14 | 42951 (0.7894)    12108823331 2022-04-08 08:48:15
42944 (1.5788)    12108822966 2022-04-08 08:48:14 | 42952 (2.2685)    12108823400 2022-04-08 08:48:15
42943 (1.5788)    12108823038 2022-04-08 08:48:14 | 42953 (0.3464)    12108823334 2022-04-08 08:48:15
42942 (0.101)     12108820178 2022-04-08 08:48:13 | 42954 (0.2763)    12108823244 2022-04-08 08:48:15
42941 (5.1974)    12108822349 2022-04-08 08:48:14 | 42955 (0.1397)    12108823420 2022-04-08 08:48:15
42940 (0.7418)    12108822603 2022-04-08 08:48:14 | 42956 (0.2934)    12108823110 2022-04-08 08:48:14
42939 (2.6955)    12108822468 2022-04-08 08:48:14 | 42957 (5.337)     12108823293 2022-04-08 08:48:15
42938 (1.2503)    12108822037 2022-04-08 08:48:14 | 42958 (2.0017)    12108820585 2022-04-08 08:48:13
42936 (1.0394)    12108822793 2022-04-08 08:48:14 | 42959 (0.4657)    12108821692 2022-04-08 08:48:14
2022-04-08 08:48:16 Last trade:  2022-04-08T13:48:15.679Z 42952 BUY (0.046)
Bid                                          | Ask
42951 (1.9788)    12108824136 2022-04-08 08:48:15 | 42952 (1.7185)    12108824132 2022-04-08 08:48:15
42950 (1.5788)    12108823950 2022-04-08 08:48:15 | 42953 (1.1574)    12108824083 2022-04-08 08:48:15
42949 (1.5788)    12108823971 2022-04-08 08:48:15 | 42954 (0.8325)    12108823967 2022-04-08 08:48:15
42948 (0.7894)    12108824009 2022-04-08 08:48:15 | 42955 (0.1397)    12108824189 2022-04-08 08:48:16
42947 (1.2468)    12108823674 2022-04-08 08:48:15 | 42956 (0.2934)    12108823110 2022-04-08 08:48:14
42944 (5.297)     12108823905 2022-04-08 08:48:15 | 42957 (5.337)     12108823879 2022-04-08 08:48:15
42942 (0.101)     12108820178 2022-04-08 08:48:13 | 42958 (2.0017)    12108820585 2022-04-08 08:48:13
42940 (0.5822)    12108823656 2022-04-08 08:48:15 | 42959 (0.4657)    12108821692 2022-04-08 08:48:14
42939 (2.6955)    12108822468 2022-04-08 08:48:14 | 42961 (0.6528)    12108823328 2022-04-08 08:48:15
42938 (1.2503)    12108822037 2022-04-08 08:48:14 | 42962 (1.7261)    12108822052 2022-04-08 08:48:14
2022-04-08 08:48:17 Last trade:  2022-04-08T13:48:16.949Z 42952 BUY (0.1152)
Bid                                          | Ask
42951 (1.2056)    12108825863 2022-04-08 08:48:17 | 42952 (1.1417)    12108825752 2022-04-08 08:48:17
42950 (1.5788)    12108823950 2022-04-08 08:48:15 | 42954 (0.4104)    12108825849 2022-04-08 08:48:17
42949 (1.5788)    12108825496 2022-04-08 08:48:16 | 42955 (0.1397)    12108825698 2022-04-08 08:48:17
42948 (1.5788)    12108825537 2022-04-08 08:48:16 | 42956 (0.2934)    12108825480 2022-04-08 08:48:16
42947 (1.2468)    12108825608 2022-04-08 08:48:16 | 42957 (0.1397)    12108824979 2022-04-08 08:48:16
42944 (0.1)       12108825461 2022-04-08 08:48:16 | 42958 (2.0017)    12108820585 2022-04-08 08:48:13
42943 (5.1972)    12108825713 2022-04-08 08:48:17 | 42959 (0.4657)    12108821692 2022-04-08 08:48:14
42942 (0.101)     12108824817 2022-04-08 08:48:16 | 42960 (5.197)     12108825509 2022-04-08 08:48:16
42940 (0.5822)    12108823656 2022-04-08 08:48:15 | 42961 (0.1347)    12108824338 2022-04-08 08:48:16
42939 (2.6955)    12108822468 2022-04-08 08:48:14 | 42962 (1.7261)    12108825408 2022-04-08 08:48:16
```