

Output Document

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Lab 2: Asterix and the Microservice Stock Bazaar

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No Virtualization

Number of Clients = 5

Threadpool size = 40

Client and Server on the same machine

Frontend Service

```
sahil@sahil-dell:~/Desktop/Spring_23/677/Lab/spring23-lab3-aishwarya-n-sahil$ python3 src/front-end/service.py
MainThread : USING_DOCKER is set as False <class 'bool'>
MainThread : Starting threaded httpd server on 0.0.0.0:8000

Thread-1 (process_request_thread) : Received GET request on url /stocks/HelloWorld
Thread-1 (process_request_thread) : Calling lookup service
Thread-2 (process_request_thread) : Received GET request on url /stocks/hey
Thread-2 (process_request_thread) : Calling lookup service
Thread-3 (process_request_thread) : Received GET request on url /stocks/BoarCo
Thread-3 (process_request_thread) : Calling lookup service
Thread-1 (process_request_thread) : Received lookup response - 400 Bad request. HelloWorld stock not found in db
127.0.0.1 - - [27/Mar/2023 12:14:32] "GET /stocks/HelloWorld HTTP/1.1" 400 -
Thread-1 (process_request_thread) : Finished GET request

Thread-2 (process_request_thread) : Received lookup response - 400 Bad request. hey stock not found in db
127.0.0.1 - - [27/Mar/2023 12:14:32] "GET /stocks/hey HTTP/1.1" 400 -
Thread-2 (process_request_thread) : Finished GET request

Thread-4 (process_request_thread) : Received GET request on url /stocks/BoarCo
Thread-4 (process_request_thread) : Calling lookup service
Thread-5 (process_request_thread) : Received GET request on url /stocks>HelloWorld
Thread-5 (process_request_thread) : Calling lookup service
Thread-3 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1384}}
127.0.0.1 - - [27/Mar/2023 12:14:32] "GET /stocks/BoarCo HTTP/1.1" 200 -
Thread-3 (process_request_thread) : Finished GET request

Thread-4 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1384}}
127.0.0.1 - - [27/Mar/2023 12:14:32] "GET /stocks/BoarCo HTTP/1.1" 200 -
Thread-3 (process_request_thread) : Received POST request on url /orders
Thread-5 (process_request_thread) : Received lookup response - 400 Bad request. HelloWorld stock not found in db
127.0.0.1 - - [27/Mar/2023 12:14:32] "GET /stocks>HelloWorld HTTP/1.1" 400 -
Thread-3 (process_request_thread) : data - {'name': 'BoarCo', 'quantity': -3, 'type': 'sell'} <class 'dict'>
Thread-3 (process_request_thread) : Calling trade service
Thread-4 (process_request_thread) : Finished GET request

Thread-5 (process_request_thread) : Finished GET request

Thread-4 (process_request_thread) : Received POST request on url /orders
Thread-4 (process_request_thread) : data - {'name': 'BoarCo', 'quantity': 29, 'type': 'sell'} <class 'dict'>
Thread-4 (process_request_thread) : Calling trade service
Thread-3 (process_request_thread) : Received trade response - 400 Invalid quantity -3
127.0.0.1 - - [27/Mar/2023 12:14:32] "POST /orders HTTP/1.1" 400 -
Thread-3 (process_request_thread) : Finished POST request

Thread-4 (process_request_thread) : Received trade response - 200 {'data': {'transaction_number': 1}}
127.0.0.1 - - [27/Mar/2023 12:14:32] "POST /orders HTTP/1.1" 200 -
Thread-4 (process_request_thread) : Finished POST request

Thread-1 (process_request_thread) : Received GET request on url /stocks/hey
Thread-1 (process_request_thread) : Calling lookup service
Thread-2 (process_request_thread) : Received GET request on url /stocks/hey
```

```

Thread-5 (process_request_thread) : Finished GET request

Thread-3 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 3018}}
127.0.0.1 - - [27/Mar/2023 12:14:33] "GET /stocks/MenhirCo HTTP/1.1" 200 -
Thread-3 (process_request_thread) : Finished GET request

Thread-3 (process_request_thread) : Received POST request on url /orders
Thread-3 (process_request_thread) : data - {'name': 'MenhirCo', 'quantity': -6, 'type': 'buy'} <class 'dict'>
Thread-3 (process_request_thread) : Calling trade service
Thread-3 (process_request_thread) : Received trade response - 400 Invalid quantity -6
127.0.0.1 - - [27/Mar/2023 12:14:33] "POST /orders HTTP/1.1" 400 -
Thread-3 (process_request_thread) : Finished POST request

Thread-4 (process_request_thread) : Received GET request on url /stocks/MenhirCo
Thread-4 (process_request_thread) : Calling lookup service
Thread-4 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 3018}}
127.0.0.1 - - [27/Mar/2023 12:14:33] "GET /stocks/MenhirCo HTTP/1.1" 200 -
Thread-4 (process_request_thread) : Finished GET request

Thread-4 (process_request_thread) : Received POST request on url /orders
Thread-4 (process_request_thread) : data - {'name': 'MenhirCo', 'quantity': -4, 'type': 'throw'} <class 'dict'>
Thread-4 (process_request_thread) : Calling trade service
Thread-4 (process_request_thread) : Received trade response - 400 Invalid quantity -4
127.0.0.1 - - [27/Mar/2023 12:14:33] "POST /orders HTTP/1.1" 400 -
Thread-4 (process_request_thread) : Finished POST request

Thread-2 (process_request_thread) : Received GET request on url /stocks/BoarCo
Thread-2 (process_request_thread) : Calling lookup service
Thread-1 (process_request_thread) : Received GET request on url /stocks/Helloworld
Thread-1 (process_request_thread) : Calling lookup service
Thread-1 (process_request_thread) : Received lookup response - 400 Bad request. HelloWorld stock not found in db
127.0.0.1 - - [27/Mar/2023 12:14:34] "GET /stocks/Helloworld HTTP/1.1" 400 -
Thread-2 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1413}}
127.0.0.1 - - [27/Mar/2023 12:14:34] "GET /stocks/BoarCo HTTP/1.1" 200 -
Thread-1 (process_request_thread) : Finished GET request

Thread-2 (process_request_thread) : Finished GET request

Thread-2 (process_request_thread) : Received POST request on url /orders
Thread-2 (process_request_thread) : data - {'name': 'BoarCo', 'quantity': 41, 'type': 'buy'} <class 'dict'>
Thread-2 (process_request_thread) : Calling trade service
Thread-2 (process_request_thread) : Received trade response - 200 {'data': {'transaction_number': 2}}
127.0.0.1 - - [27/Mar/2023 12:14:34] "POST /orders HTTP/1.1" 200 -
Thread-2 (process_request_thread) : Finished POST request

Thread-5 (process_request_thread) : Received GET request on url /stocks/FishCo
Thread-5 (process_request_thread) : Calling lookup service
Thread-5 (process_request_thread) : Received lookup response - 200 {'data': {'name': 'FishCo', 'price': 17.99, 'quantity': 997}}
127.0.0.1 - - [27/Mar/2023 12:14:34] "GET /stocks/FishCo HTTP/1.1" 200 -
Thread-5 (process_request_thread) : Finished GET request

Thread-5 (process_request_thread) : Received POST request on url /orders

```

In this case, we are running 5 clients client. In the above image, we can see that all the client requests are served by 5 different threads.

Pyro Name Server

```

sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil$ python3 -m Pyro5.nameserver --host="0.0.0.0" --port=9090
Broadcast server running on 0.0.0.0:9090
NS running on 0.0.0.0:9090 (0.0.0.0)
URI = PYRO:Pyro.NameServer@0.0.0.0:9090

```

Catalog Service (PyRO)

```
sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil$ python3 src/back-end/catalog_service/catalog_service.py
MainThread : USING_DOCKER is set as False <class 'bool'>
MainThread : Existing Stock DB File Found.
MainThread : Loading stock db
MainThread : Catalog service ready
Pyro-Worker-140493422291712 : Read lock - acquired
Pyro-Worker-140493422291712 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140493422291712 : Read lock - released
Pyro-Worker-140493422294688 : Read lock - acquired
Pyro-Worker-140493422294688 : Bad request. hey stock not found in db
Pyro-Worker-140493422294688 : Read lock - released
Pyro-Worker-140493422296128 : Read lock - acquired
Pyro-Worker-140493422296128 : BoarCo present in db
Pyro-Worker-140493422296128 : Read lock - released
Pyro-Worker-140493422295408 : Read lock - acquired
Pyro-Worker-140493422295408 : BoarCo present in db
Pyro-Worker-140493422295408 : Read lock - released
Pyro-Worker-140493422291712 : Read lock - acquired
Pyro-Worker-140493422291712 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140493422291712 : Read lock - released
Pyro-Worker-140493422296128 : Read lock - acquired
Pyro-Worker-140493422296128 : BoarCo present in db
Pyro-Worker-140493422296128 : Read lock - released
Pyro-Worker-140493422294688 : Write lock - acquired
Pyro-Worker-140493422294688 : Write lock - released
Pyro-Worker-140493422294688 : Updated BoarCo quantity by 29 in db
Pyro-Worker-140493422295408 : Read lock - acquired
Pyro-Worker-140493422295408 : Bad request. hey stock not found in db
Pyro-Worker-140493422291712 : Read lock - acquired
Pyro-Worker-140493422295408 : Read lock - released
Pyro-Worker-140493422291712 : Bad request. hey stock not found in db
Pyro-Worker-140493422296128 : Read lock - acquired
Pyro-Worker-140493422296128 : Bad request. hey stock not found in db
Pyro-Worker-140493422296128 : Read lock - released
Pyro-Worker-140493422294688 : Read lock - acquired
Pyro-Worker-140493422294688 : MenhirCo present in db
Pyro-Worker-140493422294688 : Read lock - released
Pyro-Worker-140493422295408 : Read lock - acquired
Pyro-Worker-140493422295408 : MenhirCo present in db
Pyro-Worker-140493422295408 : Read lock - released
Pyro-Worker-140493422291712 : Read lock - acquired
Pyro-Worker-140493422296128 : Read lock - acquired
Pyro-Worker-140493422291712 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140493422296128 : BoarCo present in db
Pyro-Worker-140493422291712 : Read lock - released
Pyro-Worker-140493422294688 : Read lock - acquired
Pyro-Worker-140493422294688 : BoarCo present in db
Pyro-Worker-140493422294688 : Read lock - released
Pyro-Worker-140493422295408 : Write lock - acquired
Pyro-Worker-140493422295408 : Write lock - released
Pyro-Worker-140493422295408 : Updated BoarCo quantity by -41 in db
```

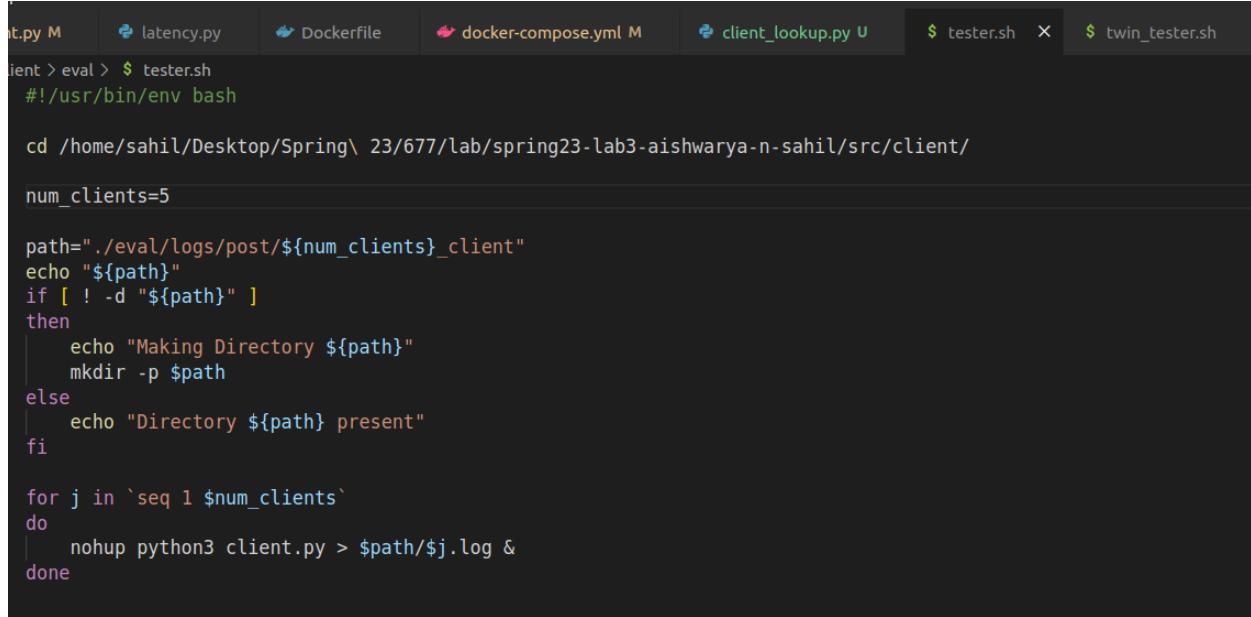
Order Service (PyRO)

```
sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil$ python3 src/back-end/order_service/order_service.py
MainThread : USING_DOCKER is set as False <class 'bool'>
MainThread : Existing Order Log File Found.
MainThread : TXN_NUM is initialized as 0
MainThread : Order service ready
Pyro-Worker-140390785387392 : Received trade request - {'name': 'BoarCo', 'quantity': -3, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140390785387392 : Invalid quantity -3
Pyro-Worker-140390785388112 : Received trade request - {'name': 'BoarCo', 'quantity': 29, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140390785388112 : Calling lookup service - BoarCo
Pyro-Worker-140390785388112 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1384}}
Pyro-Worker-140390785388112 : BoarCo present in db
Pyro-Worker-140390785388112 : Calling update service - BoarCo
Pyro-Worker-140390785388112 : Received update response - BoarCo
Pyro-Worker-140390785388112 : Executing sell trade for BoarCo with change of 29 in its quantity
Pyro-Worker-140390785386672 : Received trade request - {'name': 'MenhirCo', 'quantity': -6, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140390785386672 : Invalid quantity -6
Pyro-Worker-140390785384656 : Received trade request - {'name': 'MenhirCo', 'quantity': -4, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785384656 : Invalid quantity -4
Pyro-Worker-140390785387392 : Received trade request - {'name': 'BoarCo', 'quantity': 41, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140390785387392 : Calling lookup service - BoarCo
Pyro-Worker-140390785387392 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1413}}
Pyro-Worker-140390785387392 : BoarCo present in db
Pyro-Worker-140390785387392 : Calling update service - BoarCo
Pyro-Worker-140390785387392 : Received update response - BoarCo
Pyro-Worker-140390785387392 : Executing buy trade for BoarCo with change of -41 in its quantity
Pyro-Worker-140390785388112 : Received trade request - {'name': 'FishCo', 'quantity': -6, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140390785388112 : Invalid quantity -6
Pyro-Worker-140390785386672 : Received trade request - {'name': 'MenhirCo', 'quantity': 3, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785386672 : Unknow trade type - throw
Pyro-Worker-140390785384656 : Received trade request - {'name': 'FishCo', 'quantity': 6, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785384656 : Unknow trade type - throw
Pyro-Worker-140390785387392 : Received trade request - {'name': 'GameStart', 'quantity': 39, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785387392 : Unknow trade type - throw
Pyro-Worker-140390785388112 : Received trade request - {'name': 'MenhirCo', 'quantity': 0, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785388112 : Invalid quantity 0
Pyro-Worker-140390785386672 : Received trade request - {'name': 'GameStart', 'quantity': 11, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140390785386672 : Calling lookup service - GameStart
Pyro-Worker-140390785386672 : Received lookup response - 200 {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 514}}
Pyro-Worker-140390785386672 : GameStart present in db
Pyro-Worker-140390785386672 : Calling update service - GameStart
Pyro-Worker-140390785386672 : Received update response - GameStart
Pyro-Worker-140390785386672 : Executing sell trade for GameStart with change of 11 in its quantity
Pyro-Worker-140390785384656 : Received trade request - {'name': 'GameStart', 'quantity': 21, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140390785384656 : Unknow trade type - throw
Pyro-Worker-140390785387392 : Received trade request - {'name': 'FishCo', 'quantity': 33, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140390785387392 : Calling lookup service - FishCo
Pyro-Worker-140390785388112 : Received trade request - {'name': 'FishCo', 'quantity': -2, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140390785388112 : Invalid quantity -2
Pyro-Worker-140390785387392 : Received lookup response - 200 {'data': {'name': 'FishCo', 'price': 17.99, 'quantity': 997}}
Pyro-Worker-140390785387392 : FishCo present in db
Pyro-Worker-140390785387392 : Calling update service - FishCo
Pyro-Worker-140390785387392 : Received update response - FishCo
Pyro-Worker-140390785387392 : Executing sell trade for FishCo with change of 33 in its quantity
```

In both the PyRO services above, we can see multiple requests are being handled by different threads.

Client

Tester.sh file to start multiple clients at the same time. Here we have 5 clients sending the requests



```
client > eval > $ tester.sh
#!/usr/bin/env bash

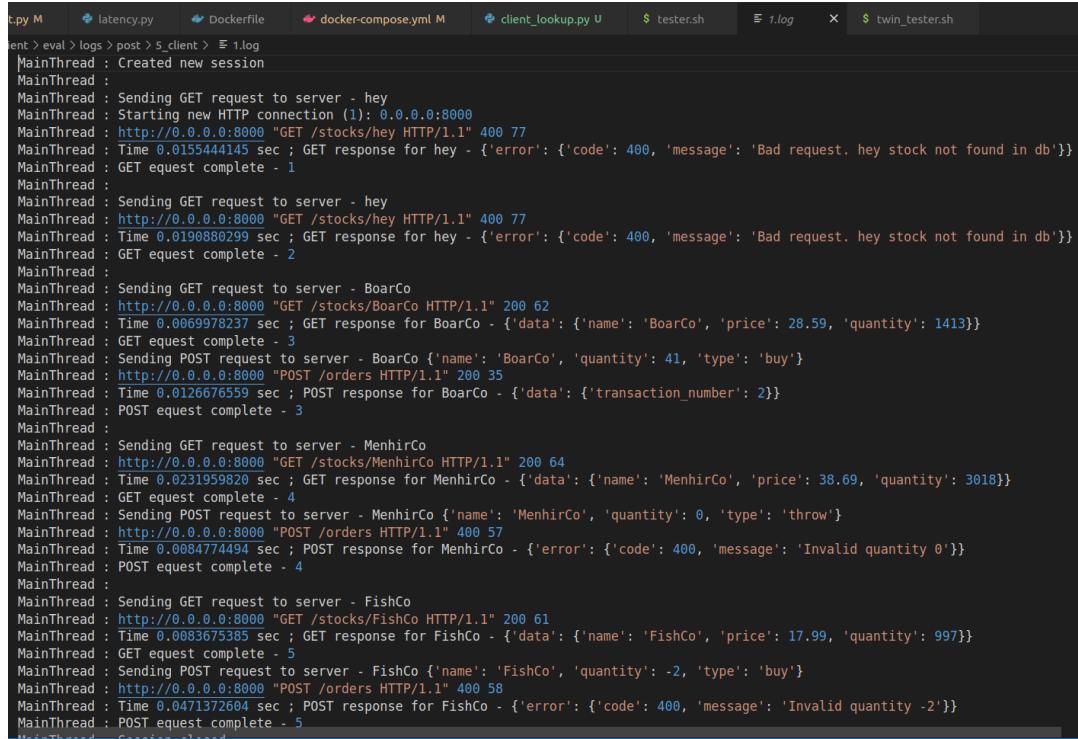
cd /home/sahil/Desktop/Spring\ 23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/

num_clients=5

path="../eval/logs/post/${num_clients}_client"
echo "${path}"
if [ ! -d "${path}" ]
then
    echo "Making Directory ${path}"
    mkdir -p $path
else
    echo "Directory ${path} present"
fi

for j in `seq 1 $num_clients`
do
    nohup python3 client.py > $path/$j.log &
done
```

Log file of one of the clients



```
t.log M latency.py Dockerfile docker-compose.yml M client_lookup.py U tester.sh × $ twin_tester.sh

MainThread : Created new session
MainThread :
MainThread : Sending GET request to server - hey
MainThread : Starting new HTTP connection (1): 0.0.0.0:8000
MainThread : http://0.0.0.0:8000 "GET /stocks/hey HTTP/1.1" 400 77
MainThread : Time 0.0155444145 sec ; GET response for hey - {'error': {'code': 400, 'message': 'Bad request. hey stock not found in db'}}
MainThread : GET equest complete - 1
MainThread :
MainThread : Sending GET request to server - hey
MainThread : http://0.0.0.0:8000 "GET /stocks/hey HTTP/1.1" 400 77
MainThread : Time 0.0190880299 sec ; GET response for hey - {'error': {'code': 400, 'message': 'Bad request. hey stock not found in db'}}
MainThread : GET equest complete - 2
MainThread :
MainThread : Sending GET request to server - BoarCo
MainThread : http://0.0.0.0:8000 "GET /stocks/BoarCo HTTP/1.1" 200 62
MainThread : Time 0.0069978237 sec ; GET response for BoarCo - {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 1413}}
MainThread : GET equest complete - 3
MainThread : Sending POST request to server - BoarCo {'name': 'BoarCo', 'quantity': 41, 'type': 'buy'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 200 35
MainThread : Time 0.0126676559 sec ; POST response for BoarCo - {'data': {'transaction_number': 2}}
MainThread : POST equest complete - 3
MainThread :
MainThread : Sending GET request to server - MenhirCo
MainThread : http://0.0.0.0:8000 "GET /stocks/MenhirCo HTTP/1.1" 200 64
MainThread : Time 0.0231959820 sec ; GET response for MenhirCo - {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 3018}}
MainThread : GET equest complete - 4
MainThread : Sending POST request to server - MenhirCo {'name': 'MenhirCo', 'quantity': 0, 'type': 'throw'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 400 57
MainThread : Time 0.0084774494 sec ; POST response for MenhirCo - {'error': {'code': 400, 'message': 'Invalid quantity 0'}}
MainThread : POST equest complete - 4
MainThread :
MainThread : Sending GET request to server - FishCo
MainThread : http://0.0.0.0:8000 "GET /stocks/FishCo HTTP/1.1" 200 61
MainThread : Time 0.0083675385 sec ; GET response for FishCo - {'data': {'name': 'FishCo', 'price': 17.99, 'quantity': 997}}
MainThread : GET equest complete - 5
MainThread : Sending POST request to server - FishCo {'name': 'FishCo', 'quantity': -2, 'type': 'buy'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 400 58
MainThread : Time 0.0471372604 sec ; POST response for FishCo - {'error': {'code': 400, 'message': 'Invalid quantity -2'}}
MainThread : POST equest complete - 5
MainThread : GET equest complete - 5
```

The server on Edlab and the Client on the local machine

Frontend Service

```
| sahiljindal@elinux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ python3 src/front-end/service.py
MainThread : USING_DOCKER is set as False <class 'bool'>
MainThread : Starting threaded httpd server on 0.0.0.0:8000

Thread-1 : Received GET request on url /stocks/BoarCo
Thread-1 : Calling lookup service
Thread-1 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 916}}
71.233.186.95 - - [27/Mar/2023 18:13:28] "GET /stocks/BoarCo HTTP/1.1" 200 -
Thread-1 : Finished GET request

Thread-1 : Received POST request on url /orders
Thread-1 : data - {'name': 'BoarCo', 'quantity': 1, 'type': 'sell'} <class 'dict'>
Thread-1 : Calling trade service
Thread-2 : Received GET request on url /stocks/hey
Thread-2 : Calling lookup service
Thread-3 : Received GET request on url /stocks/BoarCo
Thread-3 : Calling lookup service
Thread-3 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 916}}
71.233.186.95 - - [27/Mar/2023 18:13:28] "GET /stocks/BoarCo HTTP/1.1" 200 -
Thread-2 : Received lookup response - 400 Bad request. hey stock not found in db
71.233.186.95 - - [27/Mar/2023 18:13:28] "GET /stocks/hey HTTP/1.1" 400 -
Thread-3 : Finished GET request

Thread-2 : Finished GET request

Thread-1 : Received trade response - 200 {'data': {'transaction_number': 1}}
71.233.186.95 - - [27/Mar/2023 18:13:28] "POST /orders HTTP/1.1" 200 -
Thread-1 : Finished POST request

Thread-5 : Received GET request on url /stocks/MenhirCo
Thread-5 : Calling lookup service
Thread-3 : Received POST request on url /orders
Thread-3 : data - {'name': 'BoarCo', 'quantity': 45, 'type': 'throw'} <class 'dict'>
Thread-3 : Calling trade service
Thread-4 : Received GET request on url /stocks/HelloWorld
Thread-4 : Calling lookup service
Thread-3 : Received trade response - 400 Unknow trade type - throw
71.233.186.95 - - [27/Mar/2023 18:13:28] "POST /orders HTTP/1.1" 400 -
Thread-3 : Finished POST request

Thread-5 : Received lookup response - 200 {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 1446}}
71.233.186.95 - - [27/Mar/2023 18:13:28] "GET /stocks/MenhirCo HTTP/1.1" 200 -
Thread-5 : Finished GET request
```

Pyro Name Server

```
| sahiljindal@elinux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ python3 -m Pyro5.nameserver --host="0.0.0.0" --port=9090
Broadcast server running on 0.0.0.0:9091
NS running on 0.0.0.0:9090 (0.0.0.0)
URI = PYRO:Pyro.NameServer@0.0.0.0:9090
[|]
```

Catalog Service (PyRO)

```
sahiljindal@elinux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ python3 src/back-end/catalog_service/catalog_service.py
MainThread : USING DOCKER is set as False <class 'bool'>
MainThread : Existing Stock DB File Found.
MainThread : Loading stock db
MainThread : Catalog service ready
Pyro-Worker-14001121183504 : Read lock - acquired
Pyro-Worker-14001121183504 : BoarCo present in db
Pyro-Worker-14001121183504 : Read lock - released
Pyro-Worker-140011217088672 : Read lock - acquired
Pyro-Worker-140011217088672 : BoarCo present in db
Pyro-Worker-140011217088672 : Read lock - released
Pyro-Worker-140011217185472 : Read lock - acquired
Pyro-Worker-140011217184560 : Read lock - acquired
Pyro-Worker-140011217185472 : BoarCo present in db
Pyro-Worker-140011217184560 : Bad request. hey stock not found in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217184560 : Read lock - released
Pyro-Worker-140011217088672 : Write lock - acquired
Pyro-Worker-140011217088672 : Write lock - released
Pyro-Worker-140011217088672 : Updated BoarCo quantity by 1 in db
Pyro-Worker-140011217185472 : Read lock - acquired
Pyro-Worker-140011217185472 : MenhirCo present in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217183504 : Read lock - acquired
Pyro-Worker-140011217183504 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140011217183504 : Read lock - released
Pyro-Worker-140011217184560 : Read lock - acquired
Pyro-Worker-140011217184560 : GameStart present in db
Pyro-Worker-140011217184560 : Read lock - released
Pyro-Worker-140011217088672 : Read lock - acquired
Pyro-Worker-140011217088672 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140011217088672 : Read lock - released
Pyro-Worker-140011217185472 : Read lock - acquired
Pyro-Worker-140011217185472 : BoarCo present in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217183504 : Read lock - acquired
Pyro-Worker-140011217183504 : MenhirCo present in db
Pyro-Worker-140011217183504 : Read lock - released
Pyro-Worker-140011217184560 : Read lock - acquired
Pyro-Worker-140011217184560 : Bad request. hey stock not found in db
Pyro-Worker-140011217184560 : Read lock - released
Pyro-Worker-140011217088672 : Read lock - acquired
Pyro-Worker-140011217088672 : BoarCo present in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217185472 : MenhirCo present in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217183504 : Read lock - acquired
Pyro-Worker-140011217183504 : MenhirCo present in db
Pyro-Worker-140011217183504 : Read lock - released
Pyro-Worker-140011217184560 : Read lock - acquired
Pyro-Worker-140011217184560 : GameStart present in db
Pyro-Worker-140011217184560 : Read lock - released
Pyro-Worker-140011217088672 : Read lock - acquired
Pyro-Worker-140011217088672 : Bad request. HelloWorld stock not found in db
Pyro-Worker-140011217088672 : Read lock - released
Pyro-Worker-140011217185472 : Read lock - acquired
Pyro-Worker-140011217185472 : BoarCo present in db
Pyro-Worker-140011217185472 : Read lock - released
Pyro-Worker-140011217183504 : Read lock - acquired
Pyro-Worker-140011217183504 : MenhirCo present in db
Pyro-Worker-140011217183504 : Read lock - released
Pyro-Worker-140011217184560 : Read lock - acquired
Pyro-Worker-140011217184560 : Bad request. hey stock not found in db
Pyro-Worker-140011217184560 : Read lock - released
Pyro-Worker-140011217088672 : Read lock - acquired
Pyro-Worker-140011217088672 : BoarCo present in db
```

Order Service (PyRO)

```
sahiljindal@elinux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ python3 src/back-end/order_service/order_service.py
MainThread : USING DOCKER is set as False <class 'bool'>
MainThread : Existing Order Log File Found.
MainThread : TXN_NUM is initialized as 0
MainThread : Order service ready
Pyro-Worker-140480024314160 : Received trade request - {'name': 'BoarCo', 'quantity': 1, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024314160 : Calling lookup service - BoarCo
Pyro-Worker-140480024314160 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 916}}
Pyro-Worker-140480024314160 : BoarCo present in db
Pyro-Worker-140480024314160 : Calling update service - BoarCo
Pyro-Worker-140480024314160 : Received update response - BoarCo
Pyro-Worker-140480024314160 : Executing sell trade for BoarCo with change of 1 in its quantity
Pyro-Worker-140480024756720 : Received trade request - {'name': 'BoarCo', 'quantity': 45, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140480024756720 : Unknow trade type - throw
Pyro-Worker-140480024759648 : Received trade request - {'name': 'MenhirCo', 'quantity': -8, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024759648 : Invalid quantity -8
Pyro-Worker-140480024688624 : Received trade request - {'name': 'GameStart', 'quantity': 24, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140480024688624 : Unknow trade type - throw
Pyro-Worker-140480024314160 : Received trade request - {'name': 'BoarCo', 'quantity': 38, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024314160 : Calling lookup service - BoarCo
Pyro-Worker-140480024756720 : Received trade request - {'name': 'MenhirCo', 'quantity': 29, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140480024756720 : Unknow trade type - throw
Pyro-Worker-140480024314160 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 917}}
Pyro-Worker-140480024314160 : BoarCo present in db
Pyro-Worker-140480024314160 : Calling update service - BoarCo
Pyro-Worker-140480024314160 : Received update response - BoarCo
Pyro-Worker-140480024314160 : Executing sell trade for BoarCo with change of 38 in its quantity
Pyro-Worker-140480024759648 : Received trade request - {'name': 'BoarCo', 'quantity': -7, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024759648 : Invalid quantity -7
Pyro-Worker-140480024688624 : Received trade request - {'name': 'BoarCo', 'quantity': 2, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024688624 : Calling lookup service - BoarCo
Pyro-Worker-140480024688624 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 955}}
Pyro-Worker-140480024688624 : BoarCo present in db
Pyro-Worker-140480024688624 : Calling update service - BoarCo
Pyro-Worker-140480024688624 : Received update response - BoarCo
Pyro-Worker-140480024688624 : Executing sell trade for BoarCo with change of 2 in its quantity
Pyro-Worker-140480024314160 : Received trade request - {'name': 'GameStart', 'quantity': -6, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024314160 : Invalid quantity -6
Pyro-Worker-140480024756720 : Received trade request - {'name': 'FishCo', 'quantity': 1, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024756720 : Calling lookup service - FishCo
Pyro-Worker-140480024756720 : Received lookup response - 200 {'data': {'name': 'FishCo', 'price': 17.99, 'quantity': 492}}
Pyro-Worker-140480024756720 : FishCo present in db
Pyro-Worker-140480024756720 : Calling update service - FishCo
```

```

Pyro-Worker-140480024759648 : Invalid quantity -7
Pyro-Worker-140480024688624 : Received trade request - {'name': 'BoarCo', 'quantity': 2, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024688624 : Calling lookup service - BoarCo
Pyro-Worker-140480024688624 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 955}}
Pyro-Worker-140480024688624 : BoarCo present in db
Pyro-Worker-140480024688624 : Calling update service - BoarCo
Pyro-Worker-140480024688624 : Received update response - BoarCo
Pyro-Worker-140480024688624 : Executing sell trade for BoarCo with change of 2 in its quantity
Pyro-Worker-140480024314166 : Received trade request - {'name': 'GameStart', 'quantity': -6, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024314166 : Invalid quantity -6
Pyro-Worker-140480024756720 : Received trade request - {'name': 'FishCo', 'quantity': 1, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024756720 : Calling lookup service - FishCo
Pyro-Worker-140480024756720 : Received lookup response - 200 {'data': {'name': 'FishCo', 'price': 17.99, 'quantity': 492}}
Pyro-Worker-140480024756720 : FishCo present in db
Pyro-Worker-140480024756720 : Calling update service - FishCo
Pyro-Worker-140480024756720 : Received update response - FishCo
Pyro-Worker-140480024756720 : Executing buy trade for FishCo with change of -1 in its quantity
Pyro-Worker-140480024759648 : Received trade request - {'name': 'MenhirCo', 'quantity': -5, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140480024759648 : Invalid quantity -5
Pyro-Worker-140480024688624 : Received trade request - {'name': 'FishCo', 'quantity': 50, 'type': 'throw'} <class 'dict'>
Pyro-Worker-140480024688624 : Unknow trade type - throw
Pyro-Worker-140480024314166 : Received trade request - {'name': 'BoarCo', 'quantity': 4, 'type': 'buy'} <class 'dict'>
Pyro-Worker-140480024314166 : Calling lookup service - BoarCo
Pyro-Worker-140480024314166 : Received lookup response - 200 {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 957}}
Pyro-Worker-140480024314166 : BoarCo present in db
Pyro-Worker-140480024314166 : Calling update service - BoarCo
Pyro-Worker-140480024314166 : Received update response - BoarCo
Pyro-Worker-140480024314166 : Executing buy trade for BoarCo with change of -4 in its quantity
Pyro-Worker-140480024756720 : Received trade request - {'name': 'GameStart', 'quantity': 14, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024756720 : Calling lookup service - GameStart
Pyro-Worker-140480024756720 : Received lookup response - 200 {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 199}}
Pyro-Worker-140480024756720 : GameStart present in db
Pyro-Worker-140480024756720 : Calling update service - GameStart
Pyro-Worker-140480024759648 : Received trade request - {'name': 'MenhirCo', 'quantity': 26, 'type': 'sell'} <class 'dict'>
Pyro-Worker-140480024759648 : Calling lookup service - MenhirCo
Pyro-Worker-140480024759648 : Received update response - MenhirCo
Pyro-Worker-140480024759648 : Executing sell trade for GameStart with change of 14 in its quantity
Pyro-Worker-140480024759648 : Received lookup response - 200 {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 1446}}
Pyro-Worker-140480024759648 : MenhirCo present in db
Pyro-Worker-140480024759648 : Calling update service - MenhirCo
Pyro-Worker-140480024759648 : Received update response - MenhirCo
Pyro-Worker-140480024759648 : Executing sell trade for MenhirCo with change of 26 in its quantity

```

Client

Tester.sh file to start multiple clients at the same time. Here we have 5 clients sending the requests

```

sahil@sahil-dell:~/Desktop/Spring_23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/eval$ sh tester.sh
./eval/logs/5_client
Directory ./eval/logs/5_client present
sahil@sahil-dell:~/Desktop/Spring_23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/eval$ nohup:
redirecting stderr to stdout
nohup: redirecting stderr to stdout
nohup: redirecting stderr to stdout
nohup: redirecting stderr to stdout

```

Log files to check the response to the client:

```
MainThread : Created new session
MainThread :
MainThread : Sending GET request to server - hey
MainThread : Starting new HTTP connection (1): elinux3.cs.umass.edu:8000
MainThread : http://elinux3.cs.umass.edu:8000 "GET /stocks/hey HTTP/1.1" 400 77
MainThread : Time 0.0875797272 sec ; GET response for hey - {'error': {'code': 400, 'message': 'Bad request. hey stock not found in db'}
MainThread : GET equest complete - 1
MainThread :
MainThread : Sending GET request to server - GameStart
MainThread : http://elinux3.cs.umass.edu:8000 "GET /stocks/GameStart HTTP/1.1" 200 63
MainThread : Time 0.0369677544 sec ; GET response for GameStart - {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 199}}
MainThread : GET equest complete - 2
MainThread :
MainThread : Sending POST request to server - GameStart {'name': 'GameStart', 'quantity': 24, 'type': 'throw'}
MainThread : http://elinux3.cs.umass.edu:8000 "POST /orders HTTP/1.1" 400 64
MainThread : Time 0.0684194565 sec ; POST response for GameStart - {'error': {'code': 400, 'message': 'Unknow trade type - throw'}}
MainThread : POST equest complete - 2
MainThread :
MainThread : Follow link (ctrl+click) to server - BoarCo
MainThread : http://elinux3.cs.umass.edu:8000 "GET /stocks/BoarCo HTTP/1.1" 200 61
MainThread : Time 0.0357832909 sec ; GET response for BoarCo - {'data': {'name': 'BoarCo', 'price': 28.59, 'quantity': 955}}
MainThread : GET equest complete - 3
MainThread :
MainThread : Sending POST request to server - BoarCo {'name': 'BoarCo', 'quantity': -7, 'type': 'buy'}
MainThread : http://elinux3.cs.umass.edu:8000 "POST /orders HTTP/1.1" 400 58
MainThread : Time 0.0362098217 sec ; POST response for BoarCo - {'error': {'code': 400, 'message': 'Invalid quantity -7'}}
MainThread : POST equest complete - 3
MainThread :
MainThread : Sending GET request to server - GameStart
MainThread : http://elinux3.cs.umass.edu:8000 "GET /stocks/GameStart HTTP/1.1" 200 63
MainThread : Time 0.0393633842 sec ; GET response for GameStart - {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 199}}
MainThread : GET equest complete - 4
MainThread :
MainThread : Sending POST request to server - GameStart {'name': 'GameStart', 'quantity': -6, 'type': 'buy'}
MainThread : http://elinux3.cs.umass.edu:8000 "POST /orders HTTP/1.1" 400 58
MainThread : Time 0.0463414192 sec ; POST response for GameStart - {'error': {'code': 400, 'message': 'Invalid quantity -6'}}
MainThread : POST equest complete - 4
MainThread : Sending GET request to server - BoarCo
```

Docker

Docker containers are running on the same machine as the clients

Server

```

[sahil@sahl-hl-dell:~/Desktop/Spring_23/r77/lab3-alishwarya-n-sahl] $ sudo docker-compose up --build
[sudo] password for sahl:
WARNING: Found orphan containers (spring23-lab3-alishwarya-n-sahl_web_1) for this project. If you removed or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up.
Building frontend
[+] Building 2.2s (12/12) FINISHED
   ==> [internal] load build definition from Dockerfile
   ==> transferring dockerfile: 193B
   ==> [internal] load .dockerignore
   ==> transferring context: 2B
   ==> [internal] load build context
   ==> transferring context: 80B
   ==> [1/7] FROM docker.io/library/python:3@sha25e:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c
   ==> CACHED [2/7] RUN pip install Pyro5
   ==> CACHED [3/7] RUN pip install pandas
   ==> CACHED [4/7] WORKDIR /app
   ==> CACHED [5/7] COPY service.py .
   ==> CACHED [6/7] COPY setup.py .
   ==> CACHED [7/7] COPY run.sh .
   ==> exporting to Image
   ==> writing layers
   ==> writing image sha256:9e7837b351c0f080427e310a9b97a48a17f3eb075654b85cbfd7f62a4610e281
Building catalog
[+] Building 3.6s (14/14) FINISHED
   ==> [internal] load build definition from Dockerfile
   ==> transferring dockerfile: 253B
   ==> [internal] load .dockerignore
   ==> transferring context: 2B
   ==> [internal] load build context
   ==> transferring context: 312B
   ==> [1/9] FROM docker.io/library/python:3@sha25e:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c
   ==> CACHED [2/9] RUN pip install Pyro5
   ==> CACHED [3/9] RUN pip install pandas
   ==> CACHED [4/9] WORKDIR /app
   ==> CACHED [5/9] COPY catalog_service.py .
   ==> CACHED [6/9] COPY rw.lock.py .
   ==> CACHED [7/9] COPY setup.py .
   ==> CACHED [8/9] COPY run.sh .
   ==> CACHED [9/9] COPY data/ /data
   ==> exporting to Image
   ==> writing layers
   ==> writing image sha256:e0df91dd0e7ff27ddb5e319c54cc6fa8db34fa84c007182d8c83f88a8ebc4545
Building order
[+] Building 4.5s (13/13) FINISHED
   ==> [internal] load .dockerignore
   ==> transferring context: 2B
   ==> [internal] load build definition from Dockerfile
   ==> transferring dockerfile: 219B
   ==> [internal] load metadata for docker.io/library/python:3
Building order
[+] Building 4.5s (13/13) FINISHED
   ==> [internal] load .dockerignore
   ==> transferring context: 2B
   ==> [internal] load build definition from Dockerfile
   ==> transferring dockerfile: 219B
   ==> [internal] load metadata for docker.io/library/python:3
   ==> [internal] load build context
   ==> transferring context: 55KB
   ==> CACHED [2/8] RUN pip install Pyro5
   ==> CACHED [3/8] RUN pip install pandas
   ==> CACHED [4/8] WORKDIR /app
   ==> CACHED [5/8] COPY order_service.py .
   ==> CACHED [6/8] COPY setup.py .
   ==> CACHED [7/8] COPY data/ /data
   ==> [8/8] COPY run.sh
   ==> exporting to Image
   ==> writing layers
   ==> writing image sha256:d4b25fbcc0857df3179dd1fb789919e1939cidfd4fa2400a31315e234e265
Starting spring23-lab3-alishwarya-n-sahl_frontend_1 ... done
Recreating spring23-lab3-alishwarya-n-sahl_order_1 ... done
Recreating spring23-lab3-alishwarya-n-sahl_catalog_1 ... done
Attaching to spring23-lab3-alishwarya-n-sahl_frontend_1, spring23-lab3-alishwarya-n-sahl_order_1, spring23-lab3-alishwarya-n-sahl_catalog_1
catalog_1  | MainThread : USING DOCKER_1 is set as True <class 'bool'>
catalog_1  | MainThread : Existing Stock DB File Found.
catalog_1  | MainThread : Loading stock...
order_1   | MainThread : USING DOCKER_1 is set as True <class 'bool'>
order_1   | MainThread : Existing Order Log File Found.
order_1   | MainThread : TXN_NUM is initialized as 0
order_1   | MainThread : Order service ready
frontend_1 | MainThread : Catalog service ready
frontend_1 | MainThread : USING DOCKER_1 is set as True <class 'bool'>
frontend_1 | MainThread : Starting threaded httpd server on 0.0.0.0:8080
frontend_1 |
frontend_1 | Thread-1 (process_request_thread) : Received GET request on url /stocks/Helloworld
frontend_1 | Thread-1 (process_request_thread) : Calling lookup service
frontend_1 | Thread-1 (process_request_thread) : Received GET request on url /stocks/MehnirCo
frontend_1 | Thread-2 (process_request_thread) : Calling lookup service
frontend_1 | Thread-3 (process_request_thread) : Calling lookup service
frontend_1 | Thread-4 (process_request_thread) : Received GET request on url /stocks/FishCo
frontend_1 | Thread-3 (process_request_thread) : Received GET request on url /stocks/Helloworld
frontend_1 | Thread-3 (process_request_thread) : Calling lookup service
frontend_1 | Thread-4 (process_request_thread) : Received GET request on url /stocks/BoarCo
frontend_1 | Thread-5 (process_request_thread) : Calling lookup service
catalog_1  | Pyro-Worker-14016147413776 : Read lock - acquired
catalog_1  | Pyro-Worker-14016147413776 : Read lock - acquired
catalog_1  | Pyro-Worker-14016147413072 : Read lock - acquired
catalog_1  | Pyro-Worker-14016147413072 : MehnirCo present in db
catalog_1  | Pyro-Worker-14016147413072 : MehnirCo stock not found in db
catalog_1  | Pyro-Worker-14016147486224 : Bad Request: Helloworld stock not found in db
catalog_1  | Pyro-Worker-14016147413776 : Read lock - released
catalog_1  | Pyro-Worker-14016147413776 : Read lock - released

```

Client

```
sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/eval$ sh tester.sh
./eval/logs/post/5_client
Directory ./eval/logs/post/5_client present
sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/eval$ nohup: nohup: redirecting stderr to stdout
^C
sahil@sahil-dell:~/Desktop/Spring 23/677/lab/spring23-lab3-aishwarya-n-sahil/src/client/eval$
```

Client log file:

```
MainThread : Created new session
MainThread :
MainThread : Sending GET request to server - HelloWorld
MainThread : Starting new HTTP connection (1): 0.0.0.0:8000
MainThread : http://0.0.0.0:8000 "GET /stocks/HelloWorld HTTP/1.1" 400 84
MainThread : Time 0.8236255646 sec ; GET response for HelloWorld - {'error': {'code': 400, 'message': 'Bad request. HelloWorld stock not found in db'}}
MainThread : GET equest complete - 1
MainThread :
MainThread : Sending GET request to server - MenhirCo
MainThread : http://0.0.0.0:8000 "GET /stocks/MenhirCo HTTP/1.1" 200 64
MainThread : Time 0.0415806770 sec ; GET response for MenhirCo - {'data': {'name': 'MenhirCo', 'price': 38.69, 'quantity': 2998}}
MainThread : GET equest complete - 2
MainThread : Sending POST request to server - MenhirCo {'name': 'MenhirCo', 'quantity': 10, 'type': 'sell'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 200 35
MainThread : Time 0.0687439442 sec ; POST response for MenhirCo - {'data': {'transaction_number': 4}}
MainThread : POST equest complete - 2
MainThread :
MainThread : Sending GET request to server - GameStart
MainThread : http://0.0.0.0:8000 "GET /stocks/GameStart HTTP/1.1" 200 63
MainThread : Time 0.0257253647 sec ; GET response for GameStart - {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 525}}
MainThread : GET equest complete - 3
MainThread : Sending POST request to server - GameStart {'name': 'GameStart', 'quantity': 23, 'type': 'buy'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 200 35
MainThread : Time 0.0446875095 sec ; POST response for GameStart - {'data': {'transaction_number': 5}}
MainThread : POST equest complete - 3
MainThread :
MainThread : Sending GET request to server - hey
MainThread : http://0.0.0.0:8000 "GET /stocks/hey HTTP/1.1" 400 77
MainThread : Time 0.0213029385 sec ; GET response for hey - {'error': {'code': 400, 'message': 'Bad request. hey stock not found in db'}}
MainThread : GET equest complete - 4
MainThread :
MainThread : Sending GET request to server - GameStart
MainThread : http://0.0.0.0:8000 "GET /stocks/GameStart HTTP/1.1" 200 63
MainThread : Time 0.0595815182 sec ; GET response for GameStart - {'data': {'name': 'GameStart', 'price': 9.99, 'quantity': 462}}
MainThread : GET equest complete - 5
MainThread : Sending POST request to server - GameStart {'name': 'GameStart', 'quantity': -2, 'type': 'buy'}
MainThread : http://0.0.0.0:8000 "POST /orders HTTP/1.1" 400 58
MainThread : Time 0.0706763268 sec ; POST response for GameStart - {'error': {'code': 400, 'message': 'Invalid quantity -2'}}
MainThread : POST equest complete - 5
```

Docker on Edlab, Client on local machine

We encountered the following issues:

```
● sahiljindal@elnux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ ls
  docker-compose.yml  docs  pyro.log  README.md  src
○ sahiljindal@elnux3:~/cs677/lab2/spring23-lab3-aishwarya-n-sahil$ ssh elsrv3
sahiljindal@elsrv3's password:
Welcome to ELSRV3

Instructions for running Docker rootless:

Run: > dockerd-rootless-setuptool.sh install
export and add variables to your environment in .bashrc (provided by output of setuptool install in previous step), to specify to socket to you Docker daemon e.g.:
> export DOCKER_HOST=unix://$XDG_RUNTIME_DIR/docker.sock
OR
change your docker cli context to use rootless mode with the following command (easier)
> docker context use rootless

Test with `docker ps` and `docker run hello-world`
Last login: Mon Mar 27 03:45:31 2023 from elnuxl.cs.umass.edu
elsrv3 -> ls
bin.linux  cs677 Mail OSX public_html
elsrv3 -> dockerd-rootless-setuptool.sh install
[WARNING] File already exists, skipping: /nfs/elsrv4/users4/grad/sahiljindal/.config/systemd/user/docker.service
+ systemctl --user --no-pager --full status docker.service
● docker.service - Docker Application Container Engine (Rootless)
   Loaded: loaded (/nfs/elsrv4/users4/grad/sahiljindal/.config/systemd/user/docker.service; enabled; vendor preset: enabled)
     Active: active (running) since Mon 2023-03-27 19:04:33 EDT; 20s ago
       Docs: https://docs.docker.com/go/rootless/
      Main PID: 104545 (rootlesskit)
        CGroup: /user.slice/user-38399.slice/user@38399.service/docker.service
           |-104545 rootlesskit --net=slirp4netns --mtu=65520 --slirp4netns-sandbox=auto --slirp4netns-seccomp=auto --disable-host-loopback --port-driver=builtin --copy-up=/etc --copy-up=/run --propagation=rslave /bin/dockerd-rootless.sh
           |  |-104570 /proc/self/exe --net=slirp4netns --mtu=65520 --slirp4netns-sandbox=auto --slirp4netns-seccomp=auto --disable-host-loopback --port-driver=r=builtin --copy-up=/etc --copy-up=/run --propagation=rslave /bin/dockerd-rootless.sh
           |  |  |-104587 slirp4netns --mtu 65520 -r 3 --disable-host-loopback --enable-sandbox --enable-seccomp 104570 tap0
           |  |  |-104594 dockerd
           |  |  |-104618 containerd --config /run/user/38399/docker/containerd/containerd.toml --log-level info

Mar 27 19:04:33 elsrv3.cs.umass.edu dockerd-rootless.sh[104594]: time="2023-03-27T19:04:33.289287046-04:00" level=info msg="Default bridge (docker0) is assigned with an IP address 172.17.0.0/16. Daemon option --ip can be used to set a preferred IP address"
Mar 27 19:04:33 elsrv3.cs.umass.edu dockerd-rootless.sh[104594]: time="2023-03-27T19:04:33.366754623-04:00" level=info msg="Loading containers: done."
Mar 27 19:04:33 elsrv3.cs.umass.edu dockerd-rootless.sh[104594]: time="2023-03-27T19:04:33.385075606-04:00" level=warning msg="WARNING: Running in rootless mode without cgroups. To enable cgroups in rootless-mode, you need to boot the system in cgroup v2 mode."
Mar 27 19:04:33 elsrv3.cs.umass.edu dockerd-rootless.sh[104594]: time="2023-03-27T19:04:33.385104370-04:00" level=warning msg="WARNING: bridge-nf-call-iptables
```

```
elsrv3 front-end) > docker build . -t frontend
[+] Building 7.8s (5/11)
=> [internal] load build definition from Dockerfile
=> [internal] transfering dockerfile: 295B
=> [internal] load .dockerrcignore
=> [internal] transferring context: 2B
=> [internal] load metadata for docker.io/library/python:3
=> ERROR [1/7] FROM docker.io/library/python:3@sha256:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c
=>  resolve docker.io/library/python:3@sha256:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c
=> sha256:3e440a7045683e27f8e2fa04000e0e078d8dfac0c971358ae0f8c65c13321c8e 55.05MB / 55.05MB
=> sha256:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c
=> sha256:aa25de88a84b4c966ce581bda7a093a06315adee8830c3d9b832196 2.22KB / 2.22KB
=> sha256:df3e9d105d6c5fb8aa4410ba84b570db5f9febf14020b70fb63c8e7c32e51fb0 7.90KB / 7.90KB
=> sha256:68a71c865a2c34678c6dea55e4b0928f751ee3c0ca91cacefe4e0578c534d6cf 5.17MB / 5.17MB
=> sha256:6d627e120214bb28a729d4b54a0ecba4c4aea0f095ca2df129480145fad2af6 196.81MB / 196.81MB
=> sha256:5a7a2c95f0f8b221d776ccf35911b86eec2f9414a44d216205a6f03e381d3d7 54.58MB / 54.58MB
=> extracting sha256:3e440a7045683e27f8e2fa04000e0e078d8dfac0c971358ae0f8c65c13321c8e
=> sha256:f8c6dc6788819f5eb5a6ee84ce72dd613d5e6406585211a064b6ef641c8a09a 6.29MB / 6.29MB
=> sha256:48bd2de548fc487bbc51e8ae99969d4ac77e412cfceec8bc529bca2ad304b3 20.05MB / 20.05MB
=> sha256:e69bcc2e2d3143195ec279932a0692697b7e3905bed8c737f1cc7f237899ea05 244B / 244B
=> sha256:284a2f2376093ba00b09f539e56047dc168703a78095640a178b0e0c5450f460 3.08MB / 3.08MB
=> [internal] load build context
=> transferring context: 7.85kB
.....
> [1/7] FROM docker.io/library/python:3@sha256:5329e75033c4446dc92d702cf8ebbeb63e549d9b83076a776f6753e10817fc3c:
.....
Dockerfile:
-----
1 | >>> FROM python:3
2 |
3 |     RUN pip install Pyro5
-----
ERROR: failed to solve: failed to register layer: ApplyLayer exit status 1 stdout: stderr: failed to lchown "/etc/gshadow" for UID 0, GID 42: lchown /etc/gshadow: operation not permitted
elsrv3 front-end) >
```

```
elsrv3 front-end) > docker pull python:3
3: Pulling from library/python
3e440a704568: Extracting [=====] 55.05MB/55.05MB
68a71c865azc: Download complete
670730c27cze: Download complete
5a7azc95f0f8: Download complete
6d627e120214: Download complete
f8c6dc678091: Download complete
48bd2de548fc: Download complete
e69bccee2d314: Download complete
284azf237609: Download complete
failed to register layer: ApplyLayer exit status 1
stdout: stderr: failed to Lchown "/etc/gshadow" for UID 0, GID 42: lchown /etc/gshadow: operation not permitted
elsrv3 front-end) > █
```

As discussed on piazza we tried to specify a custom {"data-root": "/somewhere-out-of-nfs"} in `~/.config/docker/daemon.json`, but that also didn't work for us. We were not able to write the file from our end.