

# Output Document

We have given below the sequence of steps followed and their respective screenshots. In each screenshot you can observe the logs to understand the current status of a service.

## 1. Before client sending any requests:

### Order services:

The screenshot shows the Visual Studio Code interface with the file `client.py` open. The terminal window displays the execution of the script and its initial logs. The logs show the service starting up, connecting to the database, and sending a GetLeader request to the order service at port 9723.

```
[2023-05-04 17:10:23,224] [order-service] [MainThread (4140)] [INFO] - Sending GetLeader to the order service instance at localhost:9723
[2023-05-04 17:10:27,312] [order-service] [MainThread (4140)] [ERROR] - Order service instance at localhost:9723 is not alive/unavailable
[2023-05-04 17:10:27,312] [order-service] [MainThread (4140)] [INFO] - Sending GetLeader to the order service instance at localhost:9723
[2023-05-04 17:10:31,372] [order-service] [MainThread (4140)] [ERROR] - Order service instance at localhost:9723 is not alive/unavailable
[2023-05-04 17:10:31,372] [order-service] [MainThread (4140)] [INFO] - Starting server...
```

### Catalog and Frontend:

The screenshot shows the Visual Studio Code interface with the file `client.py` open. The terminal window displays the execution of the script and its initial logs. The logs show the catalog service loading stock information from a local disk database and becoming the leader in the leader election process.

```
[2023-05-04 17:10:10,498] [catalog-service] [MainThread (27528)] [INFO] - Loading stock s info from local disk database...
[2023-05-04 17:10:10,502] [catalog-service] [MainThread (27528)] [INFO] - Done!
[2023-05-04 17:10:10,502] [catalog-service] [MainThread (27528)] [INFO] - Catalog-service serving on port: localhost:26119
[2023-05-04 17:11:20,191] [frontend-service] [MainThread (29476)] [ERROR] - Leader election
[2023-05-04 17:11:20,191] [frontend-service] [MainThread (29476)] [INFO] - Sending IsAlive to the order service instance at localhost:9723
[2023-05-04 17:11:21,292] [frontend-service] [MainThread (29476)] [ERROR] - Leader found in leader election: order service instance: 3
[2023-05-04 17:11:21,292] [frontend-service] [MainThread (29476)] [ERROR] - Broadcast leader
[2023-05-04 17:11:21,292] [frontend-service] [MainThread (29476)] [INFO] - Sending SetLeader to the order service instance at localhost:9721, leader_id=3
[2023-05-04 17:11:21,300] [frontend-service] [MainThread (29476)] [INFO] - Sending SetLeader to the order service instance at localhost:9722, leader_id=3
[2023-05-04 17:11:21,308] [frontend-service] [MainThread (29476)] [INFO] - Sending SetLeader to the order service instance at localhost:9723, leader_id=3
[2023-05-04 17:11:21,316] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Subscribing to db updates messages
```

## 2. After client sending few requests:

### **Client:**

The screenshot shows the Visual Studio Code interface. The left sidebar has icons for file, folder, search, and terminal. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, Help, and tabs for stockOrderDB\_1.txt, stockOrderDB\_2.txt, and stockOrderDB\_3.txt. The bottom status bar shows the path PS E:\UMASS Acad\Sem2\677005\labs\_labeleds\spring23-lab-3-vineeth-om\_13\src\client>, the date 04-05-2023, and the time 17:12.

**Terminal Output:**

```
src > backend > order > data > stockOrderDB_1.txt
  1 transaction_number,stockname,ordertype,quantity
→ 2+ 1,stock3,SELL,25      You, 11 seconds ago * Uncommitted changes
  3+ 2,stock5,BUY,100
  4+ 3,stock8,BUY,10

Response:{'data': {'transaction_number': 1}}
Trade Case: failure - trade quantity more than available stock volume
POST request: {'name': 'stock8', 'quantity': 100, 'type': 'BUY'}
Response:{'data': {'transaction_number': 2}}
Trade Case: failure - invalid stock name
POST request: {'name': 'stock8', 'quantity': 10, 'type': 'BUY'}
Response:{'data': {'transaction_number': 3}}
Trade Case: failure - invalid trade quantity (negative)
POST request: {'name': 'stock1', 'quantity': -5, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}
Trade Case: failure - invalid trade type
POST request: {'name': 'stock1', 'quantity': 5, 'type': 'word'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

PS E:\UMASS Acad\Sem2\677005\labs_labeleds\spring23-lab-3-vineeth-om_13\src\client> []
```

### **Catalog and Frontend:**

The screenshot shows the Visual Studio Code interface, similar to the previous one but with more log output in the terminal. The bottom status bar shows the path PS E:\UMASS Acad\Sem2\677005\labs\_labeleds\spring23-lab-3-vineeth-om\_13\src\client>, the date 04-05-2023, and the time 17:12.

**Terminal Output:**

```
[INFO] - Saving data to disk...
[2023-05-04 17:11:43,097] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: -5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:11:43,517] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 5 of type: -1 for : stock1 on catalog service
[2023-05-04 17:11:43,521] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:11:43,521] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[INFO] - Saving data to disk...
[2023-05-04 17:11:43,393] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - Trade request: stock1, -5, response status : -1
[2023-05-04 17:11:43,393] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:11:43,393] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
[2023-05-04 17:11:43,397] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - Sending trade request of type: word for : stock1 with quantity: 5
[2023-05-04 17:11:43,561] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - Trade request: stock1, 5, response status : -1
[2023-05-04 17:11:43,561] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:11:43,561] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
```

## Order services:

The screenshot shows a Visual Studio Code interface with three terminal panes. The left pane displays a file named 'client.py'. The middle and right panes show log output from three separate instances of an order service. The logs include messages like '[INFO] - Starting server...', '[INFO] - Sync Order Request: stock3, SELL,25, transaction number: 1 at order-service\_1', and '[INFO] - Trade request: stock1,BUY,100, transaction number: 2 at order-service\_1'. One instance is labeled as the leader, handling sync requests and trade requests. The other two instances are shown receiving updates from the leader.

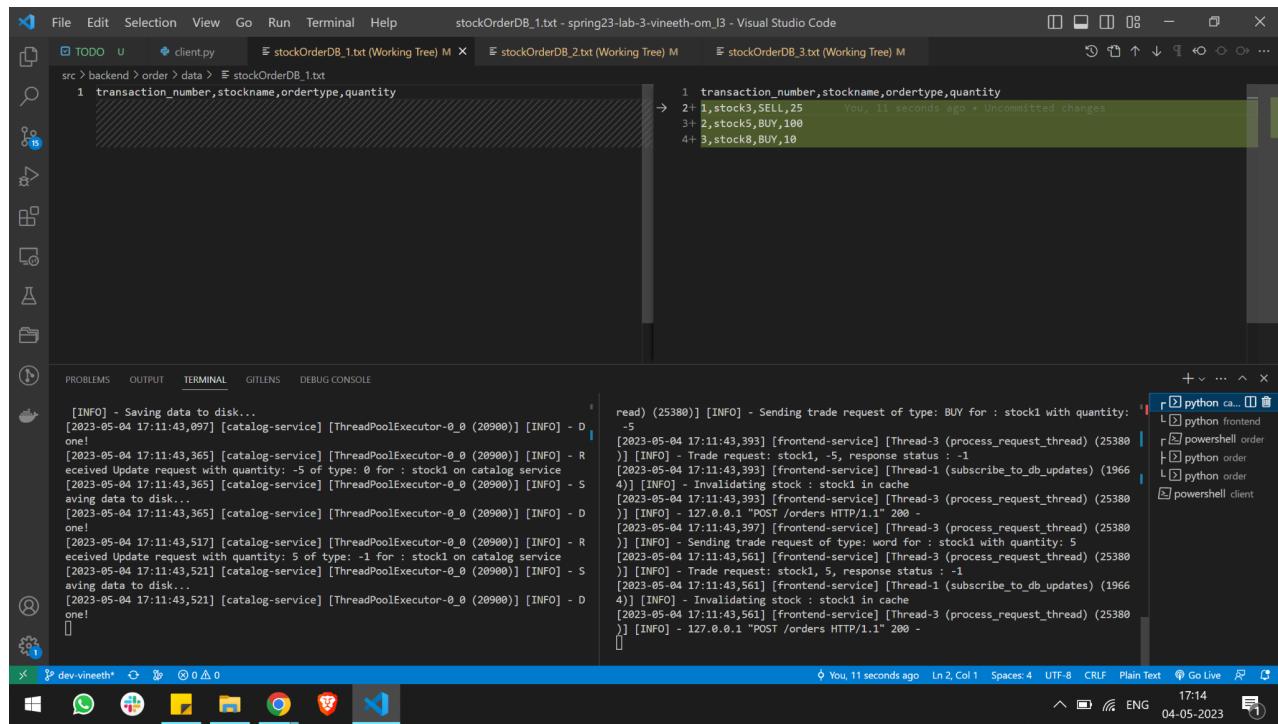
```
[2023-05-04 17:10:31,372] [order-service] [MainThread (4140)] [INFO] - Starting server...
[2023-05-04 17:11:42,506] [order-service-pb] [ThreadPoolExecutor-0 0 (27272)] [INFO] - Sync Order Request: stock3, SELL,25, transaction number: 1 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolExecutor-0 0 (27272)] [INFO] - Sync Order Request: stock5, BUY,100, transaction number: 2 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:43,173] [order-service-pb] [ThreadPoolExecutor-0 0 (27272)] [INFO] - Sync Order Request: stock8, BUY,10, transaction number: 3 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:10:42,571] [order-service] [MainThread (14652)] [INFO] - Starting server...
[2023-05-04 17:11:42,591] [order-service-pb] [ThreadPoolExecutor-0 0 (28704)] [INFO] - Sync Order Request: stock3, SELL,25, transaction number: 1 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:42,913] [order-service-pb] [ThreadPoolExecutor-0 0 (28704)] [INFO] - Sync Order Request: stock5, BUY,100, transaction number: 2 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,209] [order-service-pb] [ThreadPoolExecutor-0 0 (28704)] [INFO] - Sync Order Request: stock8, BUY,10, transaction number: 3 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,345] [order-service-pb] [ThreadPoolExecutor-0 1 (12936)] [INFO] - Received Trade request for: stock1,BUY,-5 on order-service_3
[2023-05-04 17:11:43,345] [order-service-pb] [ThreadPoolExecutor-0 1 (12936)] [INFO] - Trade request: stock1,BUY,-5, response status: -1
[2023-05-04 17:11:43,502] [order-service-pb] [ThreadPoolExecutor-0 2 (26476)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,502] [order-service-pb] [ThreadPoolExecutor-0 2 (26476)] [INFO] - Trade request: stock1,BUY,5, response: status: -1
```

We can see that the 3rd service is leader and actually getting requests from frontend, the other 2 services just get updates from the leader service.

### **3. After killing a non-leader service:**

Catalog, frontend and client are unaffected by this.

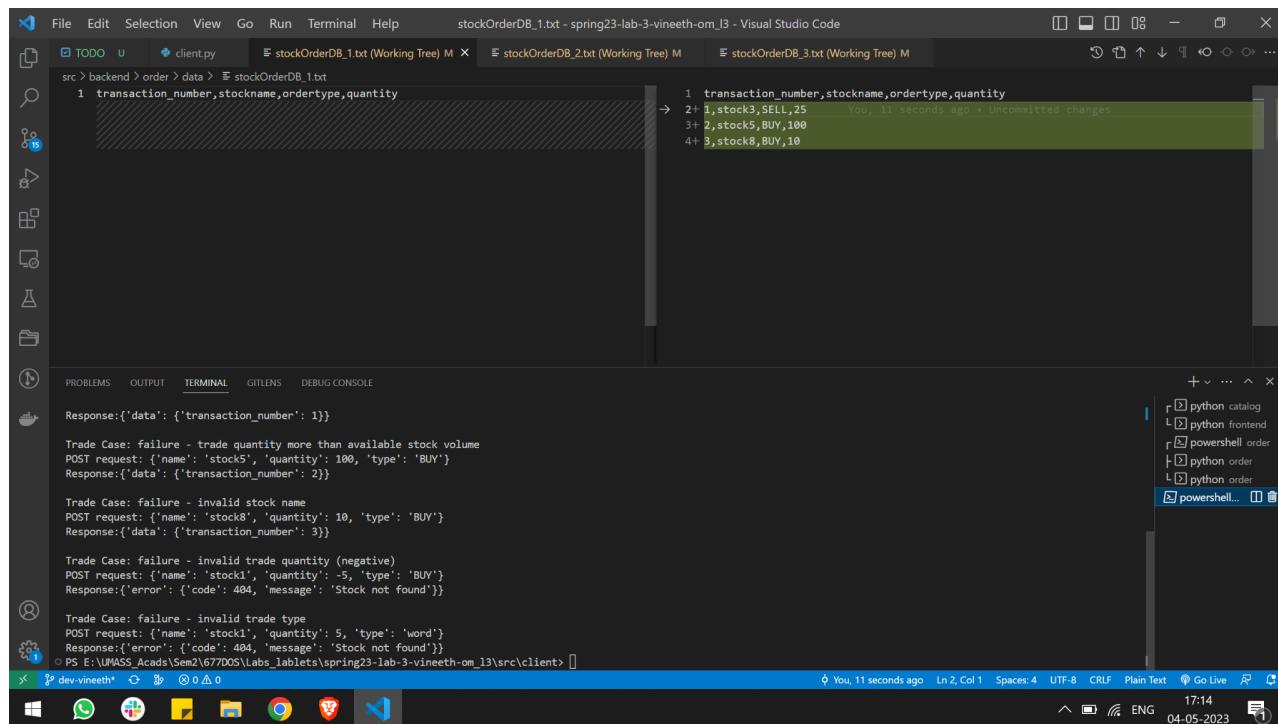
#### **Catalog and Frontend:**



The screenshot shows the Visual Studio Code interface with two terminal panes. The left terminal shows the Catalog service log, which contains several INFO-level messages about saving data to disk and receiving Update requests for stock1. The right terminal shows the Frontend service log, which contains messages about sending trade requests for stock1 and stock5, and validating stock1 in cache. Both logs show activity from May 4, 2023, at 17:11:43.

```
[INFO] - Saving data to disk...
[2023-05-04 17:11:43,097] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: -5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:11:43,365] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:11:43,517] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 5 of type: -1 for : stock1 on catalog service
[2023-05-04 17:11:43,521] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:11:43,521] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[INFO] - Trade request: stock1, -5, response status : -1
[2023-05-04 17:11:43,393] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:11:43,393] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - Sending trade request of type: BUY for : stock1 with quantity: 5
[2023-05-04 17:11:43,397] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - POST /orders HTTP/1.1" 200 -
[2023-05-04 17:11:43,561] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - Trade request: stock1, 5, response status : -1
[2023-05-04 17:11:43,561] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:11:43,561] [frontend-service] [Thread-3 (process_request_thread) (25380)] [INFO] - POST /orders HTTP/1.1" 200 -
```

#### **Client:**



The screenshot shows the Visual Studio Code interface with a single terminal pane displaying the Client service log. The log shows various test cases being run, such as 'Trade Case: failure - trade quantity more than available stock volume' and 'Trade Case: failure - invalid trade quantity (negative)'. It also shows successful responses like 'Response:{'data': {'transaction\_number': 1}}'. The log is timestamped from May 4, 2023, at 17:11:43.

```
Response:{'data': {'transaction_number': 1}}
Trade Case: failure - trade quantity more than available stock volume
POST request: {'name': 'stock5', 'quantity': 100, 'type': 'BUY'}
Response:{'data': {'transaction_number': 2}}
Trade Case: failure - invalid stock name
POST request: {'name': 'stock8', 'quantity': 10, 'type': 'BUY'}
Response:{'data': {'transaction_number': 3}}
Trade Case: failure - invalid trade quantity (negative)
POST request: {'name': 'stock1', 'quantity': -5, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}
Trade Case: failure - invalid trade type
POST request: {'name': 'stock1', 'quantity': 5, 'type': 'word'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}
```

## Order services:

```
[2023-05-04 17:10:31,372] [order-service] [MainThread (4140)] [INFO] - Starting server...
[2023-05-04 17:11:42,506] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock3, SELL,25, transaction_number: 1 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock5, BUY,100, transaction_number: 2 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 3 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:43,951] [order-service] [MainThread (4140)] [WARNING] - Keyboard interrupt
PS E:\UWASS_Acads\Sem2\677005\Labs_laptops\spring23-lab-3-vineeth-om_13\src\backend\order> 
```

```
[2023-05-04 17:10:42,571] [order-service] [MainThread (14652)] [INFO] - Starting server...
[2023-05-04 17:11:42,591] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock3, SELL,25, transaction_number: 1 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:42,913] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock5, BUY,100, transaction_number: 2 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,209] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 3 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,345] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,377] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Trade request: stock1,BUY,-5, response status: -1
[2023-05-04 17:11:43,502] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,545] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Trade request: stock1,BUY,5, response: status: -1

```

```
readPoolExecutor-0_1 (12936)] [INFO] - Sending SyncOrderRequest to the order service replica at localhost:9722 , orderId = 3
[2023-05-04 17:11:43,345] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Received Trade request for: stock1,BUY,-5 on order-service_3
[2023-05-04 17:11:43,377] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Trade request: stock1,BUY,-5, response status: -1
[2023-05-04 17:11:43,502] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,545] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Trade request: stock1,BUY,5, response: status: -1

```

```
1 transaction_number,stockname,ordertype,quantity
→ 1,stock3,SELL,25
2+,stock5,BUY,100
3+,stock8,BUY,10
4+,stock3,SELL,25
5+,stock8,BUY,10
```

```
PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE
```

```
python catalog python frontend powershell_order python order python_order powershell client
```

```
17:14 ENG 04-05-2023
```

## 4. Sending client request:

### Order services:

```
[2023-05-04 17:10:31,372] [order-service] [MainThread (4140)] [INFO] - Starting server...
[2023-05-04 17:11:42,506] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock3, SELL,25, transaction_number: 1 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock5, BUY,100, transaction_number: 2 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolExecutor-0_0 (27272)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 3 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:43,951] [order-service] [MainThread (4140)] [WARNING] - Keyboard interrupt
PS E:\UWASS_Acads\Sem2\677005\Labs_laptops\spring23-lab-3-vineeth-om_13\src\backend\order> 
```

```
[2023-05-04 17:10:42,571] [order-service] [MainThread (14652)] [INFO] - Starting server...
[2023-05-04 17:11:42,591] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock5, BUY,100, transaction_number: 2 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:42,913] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 3 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,209] [order-service-pb] [ThreadPoolExecutor-0_0 (28704)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 3 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,345] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Received SyncOrderRequest from: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,377] [order-service-pb] [ThreadPoolExecutor-0_1 (12936)] [INFO] - Trade request: stock1,BUY,-5, response status: -1
[2023-05-04 17:11:43,502] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Received SyncOrderRequest from: stock1,BUY,5 on order-service_3
[2023-05-04 17:11:43,545] [order-service-pb] [ThreadPoolExecutor-0_2 (26476)] [INFO] - Trade request: stock1,BUY,5, response: status: -1

```

```
1 transaction_number,stockname,ordertype,quantity
→ 2+,stock3,SELL,25
3+,stock5,BUY,100
4+,stock8,BUY,10
5+,stock3,SELL,25
6+,stock8,BUY,10
```

```
PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE
```

```
python catalog python frontend powershell_order python order python_order powershell client
```

```
17:16 ENG 04-05-2023
```

## Catalog and Frontend:

```

[2023-05-04 17:15:28,633] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:15:28,633] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:15:25,019] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 10 of type: 0 for : stock8 on catalog service
[2023-05-04 17:15:25,019] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - R eceived Update request with quantity: -5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:15:25,019] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - S aving data to disk...
[2023-05-04 17:15:25,019] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - D one!
[2023-05-04 17:15:25,216] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - R eceived Update request with quantity: 5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:15:25,216] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - S aving data to disk...
[2023-05-04 17:15:25,220] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - D one!
] } [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
[2023-05-04 17:15:24,878] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - Sending trade request of type: BUY for : stock1 with quantity: -5
[2023-05-04 17:15:25,059] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - Trade request: stock1, -5, response status : -1
[2023-05-04 17:15:25,059] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966
] } [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:15:25,059] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
[2023-05-04 17:15:25,063] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - Sending trade request of type: word for : stock1 with quantity: 5
[2023-05-04 17:15:25,248] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - Trade request: stock1, 5, response status : -1
[2023-05-04 17:15:25,248] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966
] } [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:15:25,248] [frontend-service] [Thread-4 (process_request_thread) (27820
] } [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
]

```

## 5. Bringing killed service back:

You can see that on restart the db file adds more entries - due to data syncing on start

### Order services before and after:

```

[2023-05-04 17:10:31,372] [order-service] [MainThread (41
40)] [INFO] - Starting server...
[2023-05-04 17:11:42,506] [order-service-pb] [ThreadPoolE
xecutor-0_0 (27272)] [INFO] - Sync Order Request: stock3,
SELL,25, transaction_number: 1 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:42,881] [order-service-pb] [ThreadPoolE
xecutor-0_0 (27272)] [INFO] - Sync Order Request: stock5,
BUY,100, transaction_number: 2 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:11:43,173] [order-service-pb] [ThreadPoolE
xecutor-0_0 (27272)] [INFO] - Sync Order Request: stock8,
BUY,10, transaction_number: 3 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:14:16,951] [order-service] [MainThread (41
40)] [WARNING] - Keyboard interrupt
o PS E:\UVAAS_Acds\Sem2\677005\Labs\lablets\spring23-lab-3
-vineeth-om_13\src\backend\order\ []
] } [INFO] - Saving order to disk...Done!
[2023-05-04 17:11:42,913] [order-service-pb] [ThreadPoolE
xecutor-0_0 (28704)] [INFO] - Sync Order Request: stock5,
BUY,100, transaction_number: 2 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:11:43,289] [order-service-pb] [ThreadPoolE
xecutor-0_0 (28704)] [INFO] - Sync Order Request: stock8,
BUY,10, transaction_number: 3 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:15:20,325] [order-service-pb] [ThreadPoolE
xecutor-0_0 (28704)] [INFO] - Sync Order Request: stock3,
SELL,25, transaction_number: 4 at order-service_2
Saving order to disk...Done!
[2023-05-04 17:15:24,858] [order-service-pb] [ThreadPoolE
xecutor-0_0 (28704)] [INFO] - Sync Order Request: stock8,
BUY,10, transaction_number: 5 at order-service_2
Saving order to disk...Done!
] } [INFO] - Saving order to disk...Done!
[2023-05-04 17:15:24,842] [order-service-pb] [ThreadPoo
lExecutor-0_1 (12936)] [INFO] - Sending SyncOrderReques
t to the order service replica at localhost:9722, order
Id = 5
[2023-05-04 17:15:25,002] [order-service-pb] [ThreadPoo
lExecutor-0_2 (26476)] [INFO] - Received Trade request
for: stock1,BUY,-5 on order-service_3
[2023-05-04 17:15:25,047] [order-service-pb] [ThreadPoo
lExecutor-0_2 (26476)] [INFO] - Trade request: stock1,B
UY,-5, response status: -1
[2023-05-04 17:15:25,200] [order-service-pb] [ThreadPoo
lExecutor-0_1 (12936)] [INFO] - Received Trade request
for: stock1,BUY,5 on order-service_3
[2023-05-04 17:15:25,232] [order-service-pb] [ThreadPoo
lExecutor-0_1 (12936)] [INFO] - Trade request: stock1,B
UY,5, response status: -1
]

```

```

[2023-05-04 17:18:33,487] [order-service] [MainThread (26156)] [INFO] - Order-service serving on port: localhost:9723
[2023-05-04 17:18:33,507] [order-service] [MainThread (26156)] [INFO] - Syncing database...
[2023-05-04 17:18:33,511] [order-service] [MainThread (26156)] [INFO] - Sending GetLeader to the order service instance at localhost:9723
[2023-05-04 17:18:33,615] [order-service] [MainThread (26156)] [INFO] - Syncing data from the Leader order service instance at localhost:9723
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Saving order to disk...Done!
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Done!
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Starting server...

```

## 6. Killing leader service:

### Order services:

```

[2023-05-04 17:18:33,615] [order-service] [MainThread (26156)] [INFO] - Syncing data from the Leader order service instance at localhost:9723
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Saving data to disk...
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Done!
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Starting server...
[2023-05-04 17:19:34,820] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3_SELL,25, transaction_number: 6 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:19:35,264] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8_BUY,10, transaction_number: 7 at order-service_1
Saving order to disk...Done!

```

## **Frontend and catalog:**

```
File Edit Selection View Go Run Terminal Help stockOrderDB_3.txt - spring-23-lab-3-vineeth-om_J3 - Visual Studio Code

src > backend > order > data > stockOrderDB_3.txt
1 transaction_number,stockname,ordertype,quantity
→ 2+ 1,stock3,SELL,25 You, 1 second ago * Uncommitted changes
3+ 2,stock5,BUY,100
4+ 3,stock8,BUY,10
5+ 4,stock3,SELL,25
6+ 5,stock8,BUY,10
7+ 6,stock3,SELL,25
8+ 7,stock8,BUY,10

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

received Update request with quantity: 10 of type: 0 for : stock8 on catalog service
[2023-05-04 17:19:35,148] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:19:35,152] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:19:35,456] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: -5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:19:35,456] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:19:35,460] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:19:35,656] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 5 of type: -1 for : stock1 on catalog service
[2023-05-04 17:19:35,656] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:19:35,660] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:20:24,811] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Sending IsAlive to the order service instance at localhost:9723
[2023-05-04 17:20:24,811] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [ERROR] - Order service instance at localhost:9723 is not alive/unavailable
Exception: <_InactiveRpcError of RPC that terminated with:
status = StatusCode.UNAVAILABLE
details = "Failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error"
debug_error_string = "UNKNOWN:failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error [created_time:'2023-05-04T21:20:24.812Z[000", grpc_status:14]>
[2023-05-04 17:20:24,815] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Sending IsAlive to the order service instance at localhost:9722
[2023-05-04 17:20:24,823] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [ERROR] - Leader found in leader election: order service instance: 2
[2023-05-04 17:20:24,823] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [ERROR] - Broadcast leader
[2023-05-04 17:20:24,823] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Sending SetLeader to the order service instance at localhost:9721, leader_id=2
[2023-05-04 17:20:24,835] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Sending SetLeader to the order service instance at localhost:9722, leader_id=2
[2023-05-04 17:20:24,847] [frontend-service] [Thread-1 (subscribe_to_db_updates) (19664)] [INFO] - Sending SetLeader to the order service instance at localhost:9723, leader_id=2
```

You can see that frontend service is affected by this - elects new leader and subscribes to db changes with that new leader service. But Client is unaffected by this.

### ***Client:***

File Edit Selection View Go Run Terminal Help

stockOrderDB\_3.txt - spring23-lab-3-vineeth-om\_l3 - Visual Studio Code

src > backend > order > data > stockOrderDB\_3.txt

transaction\_number,stockname,ordertype,quantity

1 transaction\_number,stockname,ordertype,quantity  
→ 2+,1,stock3,SELL,25 You, 1 second ago \* Uncommitted changes  
3+,2,stock5,BUY,10  
4+,3,stock8,BUY,10  
5+,4,stock3,SELL,25  
6+,5,stock8,BUY,10  
7+,6,stock3,SELL,25  
8+,7,stock8,BUY,10

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

Response:{'data': {'transaction\_number': 6}}

Trade Case: failure - trade quantity more than available stock volume  
POST request: {'name': 'stock5', 'quantity': 100, 'type': 'BUY'}  
Response:{'error': {'code': 404, 'message': 'Trading not permitted due to insufficient volume'}}

Trade Case: failure - invalid stock name  
POST request: {'name': 'stock8', 'quantity': 10, 'type': 'BUY'}  
Response:{'data': {'transaction\_number': ?}}

Trade Case: failure - invalid trade quantity (negative)  
POST request: {'name': 'stock1', 'quantity': -5, 'type': 'BUY'}  
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

Trade Case: failure - invalid trade type  
POST request: {'name': 'stock1', 'quantity': 5, 'type': 'word'}  
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

PS E:\UMASS\_Acds\Sem2\677DOS\Labs\_labtlets\spring23-lab-3-vineeth-om\_l3\src\client> []

## **7. Sending client request again:**

We can observe that client and frontend works normally (since a new leader is elected, requests are being handled fine). You can see from the order services screenshot that id 2 is the new leader.

### **Client:**

The screenshot shows the Visual Studio Code interface with several tabs open. The terminal tab displays the following Python code and its execution results:

```
src > backend > order > data > stockOrderDB_2.txt
  1 transaction_number,stockname,ordertype,quantity
    → 2+ 1,stock3,SELL,25      You, 1 second ago + Uncommitted changes
    3+ 2,stock5,BUY,100
    4+ 3,stock8,BUY,10
    5+ 4,stock3,SELL,25
    6+ 5,stock8,BUY,10
    7+ 6,stock3,SELL,25
    8+ 7,stock8,BUY,10
    9+ 8,stock3,SELL,25
    10+ 9,stock8,BUY,10

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

Trade Case: success - valid order data
POST request: {'name': 'stock3', 'quantity': 25, 'type': 'SELL'}
Response:{'data': {'transaction_number': 8}}

Trade Case: failure - trade quantity more than available stock volume
POST request: {'name': 'stock5', 'quantity': 100, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Trading not permitted due to insufficient volume'}}

Trade Case: failure - invalid stock name
POST request: {'name': 'stock9', 'quantity': 10, 'type': 'BUY'}
Response:{'data': {'transaction_number': 9}}

Trade Case: failure - invalid trade quantity (negative)
POST request: {'name': 'stock1', 'quantity': -5, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

Trade Case: failure - invalid trade type
POST request: {'name': 'stock1', 'quantity': 5, 'type': 'word'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

PS E:\UMASS_Accads\Sem2\677D05\Labs_laptops\spring23-lab-3-vineeth-om_13\src\client>
```

The terminal also shows the current date and time: 04-05-2023 17:22.

### **Catalog and Frontend:**

The screenshot shows the Visual Studio Code interface with several tabs open. The terminal tab displays logs for the catalog-service and frontend-service:

```
[2023-05-04 17:21:51,285] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:21:51,345] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 10 of type: 0 for : stock8 on catalog service
[2023-05-04 17:21:51,345] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:21:51,349] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:21:55,764] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: -5 of type: 0 for : stock1 on catalog service
[2023-05-04 17:21:55,764] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:21:55,768] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[2023-05-04 17:21:55,908] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Received Update request with quantity: 5 of type: -1 for : stock1 on catalog service
[2023-05-04 17:21:55,912] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Saving data to disk...
[2023-05-04 17:21:55,912] [catalog-service] [ThreadPoolExecutor-0_0 (20900)] [INFO] - Done!
[]

[2023-05-04 17:21:55,608] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - Trade request: stock8, 10, response status : 1
[2023-05-04 17:21:55,608] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
[2023-05-04 17:21:55,612] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - Sending trade request of type: BUY for : stock8 with quantity: -5
[2023-05-04 17:21:55,812] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - Trade request: stock1, -5, response status : -1
[2023-05-04 17:21:55,812] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:21:55,812] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
[2023-05-04 17:21:55,816] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - Sending trade request of type: word for : stock1 with quantity: 5
[2023-05-04 17:21:55,956] [frontend-service] [Thread-1 (subscribe_to_db_updates) (1966)] [INFO] - Invalidating stock : stock1 in cache
[2023-05-04 17:21:55,956] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - Trade request: stock1, 5, response status : -1
[2023-05-04 17:21:55,956] [frontend-service] [Thread-7 (process_request_thread) (24776)] [INFO] - 127.0.0.1 "POST /orders HTTP/1.1" 200 -
```

The terminal also shows the current date and time: 04-05-2023 17:22.

## Order services:

```
[2023-05-04 17:18:33,615] [order-service] [MainThread (26156)] [INFO] - Syncing data from the Leader order service instance at localhost:9723
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Saving data to disk...
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Done!
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Starting server...
[2023-05-04 17:19:34,820] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3,SELL,25, transaction_number: 6 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:19:35,264] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8,BUY,10, transaction_number: 7 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:47,020] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3,SELL,25, transaction_number: 8 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:51,441] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8,BUY,10, transaction_number: 9 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:55,596] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [ERROR] - Failed to sync transaction with service replica at localhost:9723, orderId = 9
With exception: <_InactiveRpcError of RPC that terminated with:
  status = StatusCode.UNAVAILABLE
  details = "Failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error"
  debug_error_string = "UNKNOWN:Failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error {grpc_status:14, created_time:'2023-05-04T21:21:55.5813432+00:00'}"
>
[2023-05-04 17:21:55,748] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,-5 on order-service_2
[2023-05-04 17:21:55,796] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,-5, response: status: -1
[2023-05-04 17:21:55,892] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_2
[2023-05-04 17:21:55,940] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,5, response: status: -1
```

## 8. Bringing back killed service online:

You can observe the db has new values because of db syncing on start

### Order services before and after bringing back killed service (id 3):

```
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Done!
[2023-05-04 17:18:33,915] [order-service] [MainThread (26156)] [INFO] - Starting server...
[2023-05-04 17:19:34,820] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3,SELL,25, transaction_number: 6 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:19:35,264] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8,BUY,10, transaction_number: 7 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:47,020] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3,SELL,25, transaction_number: 8 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:51,441] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8,BUY,10, transaction_number: 9 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:55,596] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [ERROR] - Failed to sync transaction with service replica at localhost:9723, orderId = 9
With exception: <_InactiveRpcError of RPC that terminated with:
  status = StatusCode.UNAVAILABLE
  details = "Failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error"
  debug_error_string = "UNKNOWN:Failed to connect to all addresses; last error: UNAVAILABLE: ipv4:127.0.0.1:9723: WSA Error {grpc_status:14, created_time:'2023-05-04T21:21:55.5813432+00:00'}"
>
[2023-05-04 17:21:55,748] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,-5 on order-service_2
[2023-05-04 17:21:55,796] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,-5, response: status: -1
[2023-05-04 17:21:55,892] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_2
[2023-05-04 17:21:55,940] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,5, response: status: -1
```

```
File Edit Selection View Go Run Terminal Help stockOrderDB_3.txt - spring23-lab-3-vineeth-om_J3 - Visual Studio Code

src > backend > order > data > stockOrderDB_3.txt
1 transaction_number,stockname,ordertype,quantity
→ 2,stock3,SELL,25 You, 4 minutes ago * Uncommitted changes
3+,stock5,BUY,100
4+,stock8,BUY,10
5+,stock3,SELL,25
6+,stock8,BUY,10
7+,stock3,SELL,25
8+,stock8,BUY,10
9+,stock3,SELL,25
10+,9,stock8,BUY,10

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

xecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3, SELL,25, transaction_number: 6 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:19:35,264] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8, BUY,10, transaction number: 7 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:47,020] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock3, SELL,25, transaction_number: 8 at order-service_1
Saving order to disk...Done!
[2023-05-04 17:21:51,441] [order-service-pb] [ThreadPoolExecutor-0_0 (24572)] [INFO] - Sync Order Request: stock8, BUY,10, transaction_number: 9 at order-service_1
Saving order to disk...Done!

0.1:9723: WSA Error {grpc_status:14, created_time:"2023-05-04T21:21:55.5813432+00:00"}>
[2023-05-04 17:21:55,748] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_2
[2023-05-04 17:21:55,796] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,-5, response: status: -1
[2023-05-04 17:21:55,892] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Received Trade request for: stock1,BUY,5 on order-service_2
[2023-05-04 17:21:55,940] [order-service-pb] [ThreadPoolExecutor-0_1 (17440)] [INFO] - Trade request: stock1,BUY,5, response: status: -1
st:9723
[2023-05-04 17:24:45,606] [order-service] [MainThread (28144)] [INFO] - Syncing database...
[2023-05-04 17:24:45,606] [order-service] [MainThread (28144)] [INFO] - Sending GetLeader to the order service instance at localhost:9722
[2023-05-04 17:24:45,646] [order-service] [MainThread (28144)] [INFO] - Syncing data from the Leader order service instance at localhost:9722
[2023-05-04 17:24:45,846] [order-service] [MainThread (28144)] [INFO] - Saving data to disk...
[2023-05-04 17:24:45,848] [order-service] [MainThread (28144)] [INFO] - Done!
[2023-05-04 17:24:45,848] [order-service] [MainThread (28144)] [INFO] - Starting server...
```

### **9. After sending client requests again:**

Client is unaffected by all of this. Can see new data in the above db and client logs.

File Edit Selection View Go Run Terminal Help stockOrderDB\_3.txt - spring23-lab-3-vineeth-om\_3 - Visual Studio Code

src > backend > order > data > stockOrderDB\_3.txt

```
1 transaction_number,stockname,ordertype,quantity
→ 2+ 1,stock3,SELL,25
3+ 2,stock5,BUY,100
4+ 3,stock8,BUY,10
5+ 4,stock3,SELL,25
6+ 5,stock8,BUY,10
7+ 6,stock3,SELL,25
8+ 7,stock8,BUY,10
9+ 8,stock3,SELL,25
10+ 9,stock8,BUY,10
11+ 10,stock3,SELL,25
12+ 11,stock8,BUY,10
```

You, 7 seconds ago \* Uncommitted changes

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

```
Trade Case: failure - trade quantity more than available stock volume
POST request: {'name': 'stock5', 'quantity': 100, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Trading not permitted due to insufficient volume'}}

Trade Case: failure - invalid stock name
POST request: {'name': 'stock8', 'quantity': 10, 'type': 'BUY'}
Response:{'data': {'transaction_number': 11}}

Trade Case: failure - invalid trade quantity (negative)
POST request: {'name': 'stock1', 'quantity': -5, 'type': 'BUY'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}

Trade Case: failure - invalid trade type
POST request: {'name': 'stock1', 'quantity': 5, 'type': 'word'}
Response:{'error': {'code': 404, 'message': 'Stock not found'}}
```

PS E:\UMASS\_Acds\Sem2\677DOS\Labs\lab3\spring23-lab-3-vineeth-om\_3\src\client> [ ]

You, 7 seconds ago In 12, Col 17 Spaces: 4 UTF-8 CRLF Plain Text Go Live ENG 04-05-2023

## **Cloud Deployment:**

### **Steps to deploy in AWS:**

```
#Create AWS EC2 Instance
```

```
aws ec2 run-instances --image-id ami-0d73480446600f555 --instance-type m5a.large  
--key-name vockey > instance.json  
aws ec2 describe-instances --instance-id i-0c6b4a0283370dd92  
aws ec2 authorize-security-group-ingress --group-name default --protocol tcp --port 22 --cidr  
0.0.0.0/0
```

```
#SSH into the machine
```

```
ssh -i labsuser.pem ubuntu@ec2-3-238-71-234.compute-1.amazonaws.com
```

```
#Clone the repo
```

```
git clone https://github.com/umass-cs677-current/spring23-lab-3-vineeth-om l3.git
```

```
#Install python 3.7 as it is required by gRPC and install pip
```

```
sudo apt update  
sudo apt install python3-pip  
pip3 install --upgrade pip  
sudo apt install software-properties-common  
sudo add-apt-repository ppa:deadsnakes/ppa  
sudo apt install python3.7
```

```
#Setting python 3.7 as default
```

```
sudo update-alternatives --config python  
sudo update-alternatives --install /usr/bin/python python /usr/bin/python3 1  
sudo update-alternatives --install /usr/bin/python3 python3 /usr/bin/python3.7 2  
sudo update-alternatives --config python  
pip3 install --upgrade pip
```

```
#Install dependencies
```

```
pip3 install grpcio  
pip3 install grpcio-tools
```

```
#Authorize frontend port 26111 to accept incoming requests
```

```
aws ec2 authorize-security-group-ingress --group-name default --protocol tcp --port 26111 --cidr  
0.0.0.0/0
```

## EC2 instance details:

Instance summary for i-0c6b4a0283370dd92 <a href="#">Info</a>		<a href="#">G</a>	Connect	Instance state ▾	Actions ▾
Updated less than a minute ago					
Instance ID	Public IPv4 address	Private IPv4 addresses			
<a href="#">i-0c6b4a0283370dd92</a>	<a href="#">3.238.71.234   open address</a>	<a href="#">172.31.79.105</a>			
IPv6 address	Instance state	Public IPv4 DNS			
-	<a href="#">Running</a>	<a href="#">ec2-3-238-71-234.compute-1.amazonaws.com   open address</a>			
Hostname type	Private IP DNS name (IPv4 only)	Elastic IP addresses			
IP name: ip-172-31-79-105.ec2.internal	<a href="#">ip-172-31-79-105.ec2.internal</a>	-			
Answer private resource DNS name	Instance type	AWS Compute Optimizer finding			
-	m5a.large	<a href="#">Opt-in to AWS Compute Optimizer for recommendations.</a>			
Auto-assigned IP address	VPC ID	<a href="#">  Learn more</a>			
<a href="#">3.238.71.234 [Public IP]</a>	<a href="#">vpc-088622d819144a692</a>				
IAM Role	Subnet ID	Auto Scaling Group name			
-	<a href="#">subnet-0254541384380273d</a>	-			
IMDSv2					
Optional					

## Screenshot showing working of application on AWS:

```
[ubuntu@ip-172-31-79-105:~/spring23-lab-3-vineeth-on_13] bash run.sh
ubuntu@ip-172-31-79-105:~/spring23-lab-3-vineeth-on_13 [2023-05-04 20:33:43.943] [catalog-service] [MainThread (140043849017152)] [INFO] - Loading stocks info from local disk database...
[2023-05-04 20:33:43.943] [catalog-service] [MainThread (140043849017152)] [INFO] - Done!
[2023-05-04 20:33:43.943] [catalog-service] [MainThread (140043849017152)] [INFO] - Catalog-service serving on port: localhost:26119
[2023-05-04 20:33:44.066] [order-service] [MainThread (140152583948096)] [INFO] - Loading stock orders from local disk database
[2023-05-04 20:33:44.066] [order-service] [MainThread (140152583948096)] [INFO] - Done!
[2023-05-04 20:33:44.066] [order-service] [MainThread (140152583948096)] [INFO] - Order-service serving on port: localhost:9722
[2023-05-04 20:33:44.066] [order-service] [MainThread (140152583948096)] [INFO] - Syncing database...
[2023-05-04 20:33:44.066] [order-service] [MainThread (140152583948096)] [INFO] - Done! The catalog-service instance is the order service instance at localhost:9723
[2023-05-04 20:33:44.103] [order-service] [MainThread (139994521233216)] [INFO] - Loading stock orders from local disk database
[2023-05-04 20:33:44.106] [order-service] [MainThread (140152583948096)] [ERROR] - Order service instance at localhost:9723 is not alive/unavailable
[2023-05-04 20:33:44.108] [order-service] [MainThread (140152583948096)] [INFO] - Sending GetLeader to the order service instance at localhost:9721
[2023-05-04 20:33:44.110] [order-service] [MainThread (140152583948096)] [ERROR] - Order service instance at localhost:9721 is not alive/unavailable
[2023-05-04 20:33:44.110] [order-service] [MainThread (140152583948096)] [INFO] - Starting server...
[2023-05-04 20:33:44.108] [order-service] [MainThread (140152583948096)] [INFO] - Starting server...
[2023-05-04 20:33:44.111] [order-service] [MainThread (140256076453696)] [INFO] - Loading stock orders from local disk database
[2023-05-04 20:33:44.111] [order-service] [MainThread (140256076453696)] [INFO] - Done!
[2023-05-04 20:33:44.111] [order-service] [MainThread (140256076453696)] [INFO] - Order-service serving on port: localhost:9723
[2023-05-04 20:33:44.116] [order-service] [MainThread (139994521233216)] [INFO] - Done!
[2023-05-04 20:33:44.116] [order-service] [MainThread (139994521233216)] [INFO] - Order-service serving on port: localhost:9721
[2023-05-04 20:33:44.116] [order-service] [MainThread (139994521233216)] [INFO] - Syncing database...
[2023-05-04 20:33:44.124] [order-service] [MainThread (139994521233216)] [INFO] - Done! The catalog-service instance is the order service instance at localhost:9723
[2023-05-04 20:33:44.131] [order-service] [MainThread (140256076453696)] [INFO] - Syncing database
[2023-05-04 20:33:44.131] [order-service] [MainThread (140256076453696)] [INFO] - Done! The catalog-service instance is the order service instance at localhost:9722
[2023-05-04 20:33:44.132] [order-service] [MainThread (140256076453696)] [INFO] - Syncing database
[2023-05-04 20:33:44.132] [order-service] [MainThread (140256076453696)] [INFO] - Done! The catalog-service instance is the order service instance at localhost:9721
[2023-05-04 20:33:44.142] [order-service] [MainThread (140256076453696)] [INFO] - Sending GetLeader to the order service instance at localhost:9721
[2023-05-04 20:33:44.142] [order-service] [MainThread (140256076453696)] [INFO] - Done! The catalog-service instance is the order service instance at localhost:9722
[2023-05-04 20:33:44.147] [order-service] [MainThread (139994521233216)] [INFO] - Starting server...
[2023-05-04 20:33:44.147] [order-service] [MainThread (140256076453696)] [INFO] - Starting server...
[2023-05-04 20:33:44.148] [order-service] [MainThread (139994521233216)] [INFO] - Starting server...
[2023-05-04 20:33:44.148] [frontend-service] [MainThread (139787411859264)] [INFO] - Server started http://0.0.0.0:26111
[2023-05-04 20:33:44.148] [frontend-service] [MainThread (139787411859264)] [ERROR] - Leader election
[2023-05-04 20:33:44.148] [frontend-service] [MainThread (139787411859264)] [INFO] - Sending IsAlive to the order service instance at localhost:9723
[2023-05-04 20:33:44.150] [frontend-service] [MainThread (139787411859264)] [INFO] - Leader found in leader election: order service instance: 3
[2023-05-04 20:33:44.150] [frontend-service] [MainThread (139787411859264)] [INFO] - Broadcast
[2023-05-04 20:33:44.156] [frontend-service] [MainThread (139787411859264)] [INFO] - Sending SetLeader to the order service instance at localhost:9721, leader_id=3
[2023-05-04 20:33:44.159] [frontend-service] [MainThread (139787411859264)] [INFO] - Sending SetLeader to the order service instance at localhost:9722, leader_id=3
[2023-05-04 20:33:44.162] [frontend-service] [MainThread (139787411859264)] [INFO] - Sending SetLeader to the order service instance at localhost:9723, leader_id=3
[2023-05-04 20:33:44.166] [frontend-service] [Thread-1 (139787067442944)] [INFO] - Subscribing to db updates messages
```

## **Postman request showing Lookup working correctly on AWS:**

The screenshot shows a Postman request for a 'StocksLookup' collection. The request is a GET to `http://ec2-3-238-71-234.compute-1.amazonaws.com:26111/stocks?stockname=stock1`. The 'Params' tab is selected, showing a query parameter `stockname` with value `stock1`. The response status is 200 OK, time 48 ms, size 228 B. The response body is a JSON object:

```
1 |   "data": {  
2 |     "name": "stock1",  
3 |     "price": 25.78,  
4 |     "quantity": 17  
5 |   }  
6 |  
7 |
```

## **Postman request showing Trade working correctly on AWS:**

The screenshot shows a Postman request for an 'Order' collection. The request is a POST to `http://ec2-3-238-71-234.compute-1.amazonaws.com:26111/orders`. The 'Body' tab is selected, showing a JSON payload:

```
1 | {  
2 |   "name": "stock1",  
3 |   "quantity": 10,  
4 |   "type": "BUY"  
5 | }
```

The response status is 200 OK, time 149 ms, size 203 B. The response body is a JSON object:

```
1 | {  
2 |   "data": {  
3 |     "transaction_number": 1  
4 |   }  
5 | }
```

## Postman request showing Order Lookup working correctly on AWS:

The screenshot shows the Postman application interface with the following details:

- Request Method:** GET
- URL:** <http://ec2-3-238-71-234.compute-1.amazonaws.com:2611/orders?order-number=1>
- Params:** order-number (Value: 1)
- Body:** JSON response (Pretty) showing the following data:

```
1 |   "data": {  
2 |     "number": 1,  
3 |     "name": "stock1",  
4 |     "type": "BUY",  
5 |     "quantity": 10  
6 |   }  
7 | }  
8 | }
```

The status bar at the bottom indicates: Status: 200 OK, Time: 85 ms, Size: 240 B, Save Response.