1. HTTP Server Output (Without Docker, Edlab)

elnux1 spring24-lab2-mitalee18-aishwaryax) > Starting server on 127.0.0.1:56363 The Order server is running. The Catalog server is running.

2. HTTP Server Output (Docker, Edlab)

```
Order received for toy: Fox and for quantity: 1
Order has been processed with OrderNumber 1906
Order processed for toy: Fox and for quantity: 1
172.18.0.1 - - [02/Apr/2024 20:53:56] "POST /orders HTTP/1.1" 200 -
Thread assigned : 139645607458496, Client ID: 4
172.18.0.1 - - [02/Apr/2024 20:53:56] "GET /products/Whale HTTP/1.1" 200 -
Order received for toy: Whale and for quantity: 1
Order has been processed with OrderNumber 1907
Order processed for toy: Whale and for quantity: 1
172.18.0.1 - - [02/Apr/2024 20:53:56] "BOST /orders HTTP/1.1" 200 -
Thread assigned : 139645607458496, Client ID: 4
172.18.0.1 - - [02/Apr/2024 20:53:56] "GET /products/Whale HTTP/1.1" 200 -
Thread assigned : 139645607458496, Client ID: 4
172.18.0.1 - - [02/Apr/2024 20:53:56] "GET /products/Elephant HTTP/1.1" 200 -
Order received for toy: Elephant and for quantity: 1
Order has been processed with OrderNumber 1908
spring24-lab2-mitalee18-aishwaryax-frontend-1
.
spring24-lab2-mitalee18-aishwaryax-frontend-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
spring24-lab2-mitalee18-aishwaryax-order-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
.
spring24-lab2-mitalee18-aishwaryax-order-1
                                                                                                       Order has been processed with OrderNumber 1908
Order processed for toy: Elephant and for quantity: 1
172.18.0.1 - - [02/Apr/2024 20:53:56] "POST /orders HTTP/1.1" 200 -
spring24-lab2-mitalee18-aishwaryax-order-1
spring24-lab2-mitalee18-aishwaryax-order-1
spring24-lab2-mitalee18-aishwaryax-frontend-1
                                                                                                       Thread assigned: 139645607458496, Client ID: 4

172.18.0.1 - - [02/Apr/2024 20:53:56] "GET /products/Tux HTTP/1.1" 200 - Order received for toy: Tux and for quantity: 1
spring24-lab2-mitalee18-aishwaryax-frontend-1
.
spring24-lab2-mitalee18-aishwaryax-order-1
spring24-lab2-mitalee18-aishwaryax-order-1
                                                                                                        Order has been processed with OrderNumber 1909
                                                                                                   Order processed for toy: Tux and for quantity: 1 | 172.18.0.1 - - [02/Apr/2024 20:53:57] "POST /orders HTTP/1.1" 200 -
spring24-lab2-mitalee18-aishwaryax-frontend-1
```

3. Bring up containers using docker compose

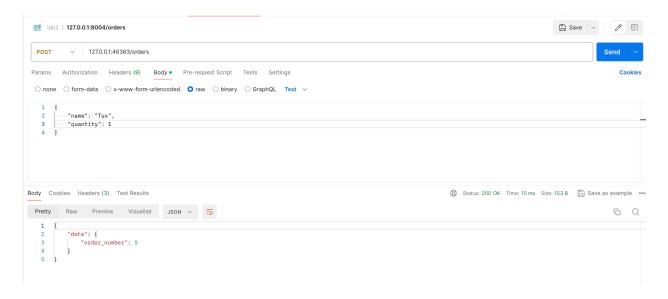
```
elsrv3 spring24-lab2-mitalee18-aishwaryax) > docker compose
                    Running 3/3
Container spring24-lab2-mitaleel8-sishwaryax-catalog-1
Recreated
Container spring24-lab2-mitaleel8-sishwaryax-rortend-1
Container spring24-lab2-mitaleel8-sishwaryax-rortend-1
Recreated
Container spring24-lab2-mitaleel8-sishwaryax-rortend-1
Recreated
Container spring24-lab2-mitaleel8-sishwaryax-rortend-1
Recreated
```

4. Tear down container

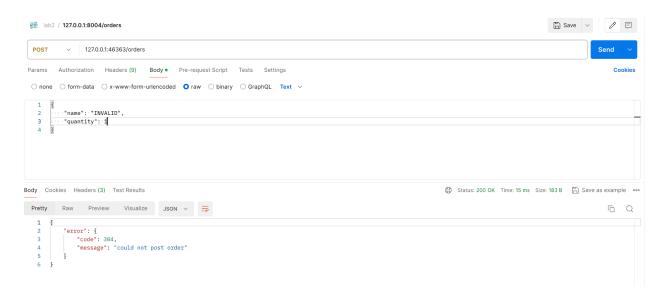
```
CGracefully stopping... (press Ctrl+C again to force borting on container exit...
  | Stoppang 3/3
| Container spring24-lab2-mitalee18-aishwaryax-frontend-1 Stoppad
| Container spring24-lab2-mitalee18-aishwaryax-order-1 Stoppad
| Container spring24-lab2-mitalee18-aishwaryax-catalog-1 Stoppad
```

5. Postman screenshots for various test cases

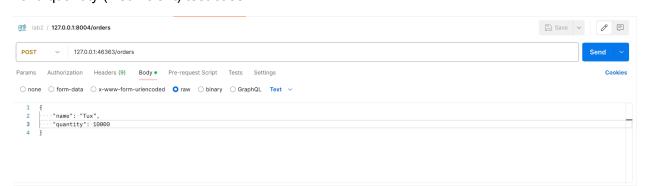
Valid order test case



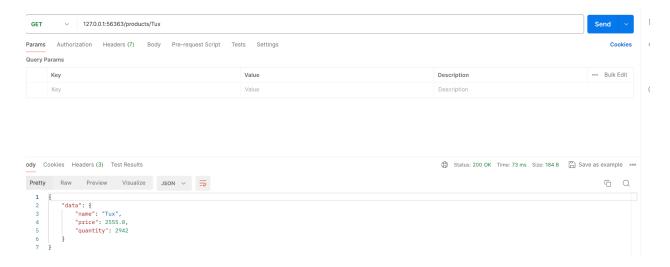
Invalid name test case



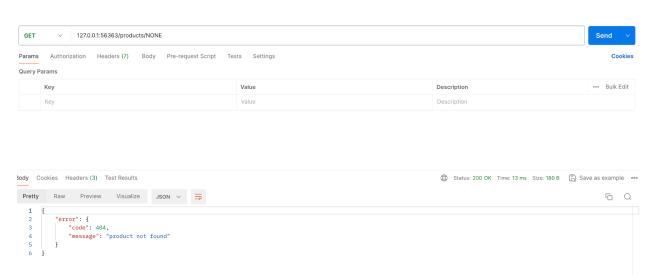
Invalid quantity (insufficient) test case



Valid test case

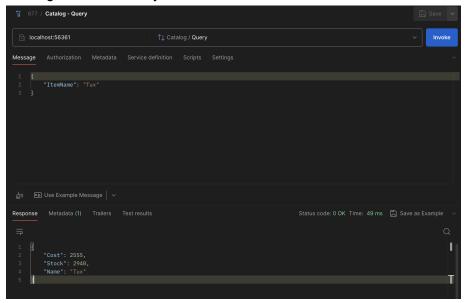


Invalid Query

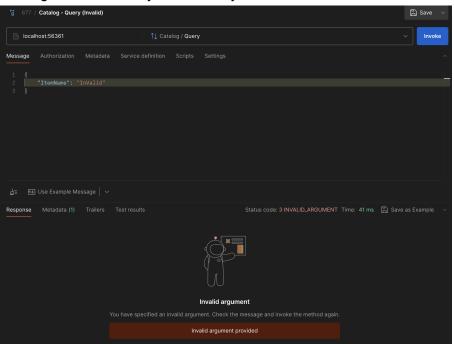


GRPC Postman Outputs

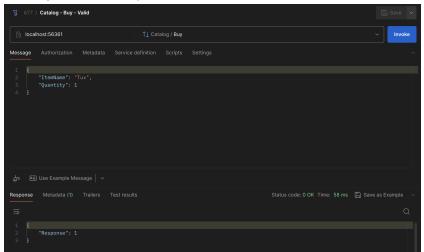
Catalog Service - Query - Valid Case



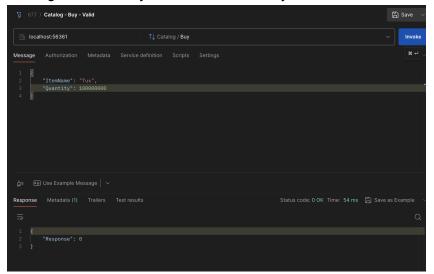
Catalog Service - Query - InValid Toy Case



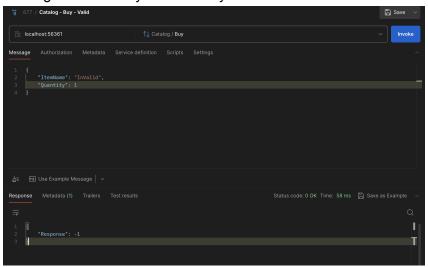
Catalog Service - Buy - Valid Case



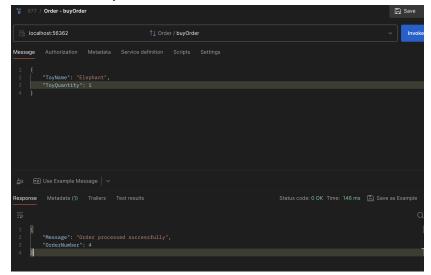
Catalog Service - Buy - Insufficient Quantity Case



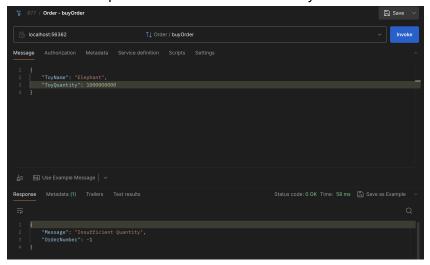
Catalog Service - Buy - InValid Toy Case



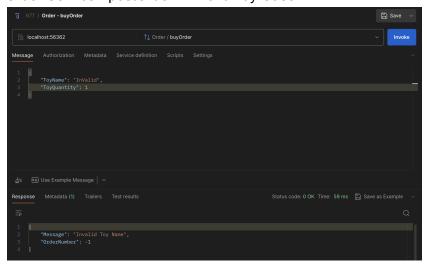
Order Service - postOrder - Valid Case



Order Service - postOrder - Insufficient Quantity Case



Order Service - postOrder - InValid Toy Case



Multithreading approach with client maintaining sessions in HTTP service

```
Thread assigned: 13072687104, Client ID: 2
Thread assigned: 13096452096, Client ID: 5
Thread assigned: 13113241600, Client ID: 3
Thread assigned: 13130031104, Client ID: 8
Thread assigned: 13146820608, Client ID: 1
Thread assigned: 13163610112, Client ID: 4
Thread assigned: 13180399616, Client ID: 9
Thread assigned: 13096452096, Client ID: 5
Thread assigned: 13197189120, Client ID: 10
Thread assigned: 13096452096, Client ID: 1
Thread assigned: 13146820608, Client ID: 6
Thread assigned: 13197189120, Client ID: 10
Thread assigned: 13213978624, Client ID: 7
Thread assigned: 13197189120, Client ID: 6
Thread assigned: 13072687104, Client ID: 2
Thread assigned: 13096452096, Client ID: 1
Thread assigned: 13113241600, Client ID: 3
Thread assigned: 13163610112, Client ID: 8
```

Client ID and Thread ID mappings are mostly maintained but in some cases they are not due to thread being already assigned to some other Client ID.

Persistence

```
Container spring24-lab2-mitalee18-aishwaryax-catalog-1
   ✓ Container spring24-lab2-mitalee18-aishwaryax-order-1
  ✓ Container spring24-lab2-mitalee18-aishwaryax-frontend-1 Recreated
11.4s
Attaching to catalog-1, frontend-1, order-1
frontend-1 | Starting server on spring24-lab2-mitalee18-aishwaryax-frontend-1:56363
order-1 | The Order server is running.
catalog-1 | The Catalog server is running.
frontend-1 | 192.168.65.1 - [03/Apr/2024 02:47:39] "GET /products/Tux HTTP/1.1" 200 -
order-1 | Order received for toy: Tux and for quantity: 1
order-1 | Order processed for toy: Tux and for quantity: 1
frontend-1 | 192.168.65.1 - [03/Apr/2024 02:49:12] "POST /orders HTTP/1.1" 200 -
frontend-1 exited with code 0
frontend-1 exited with code 0 frontend-1 exited with code 137
order-1 exited with code 0 order-1 exited with code 137
 catalog-1 exited with code 0
 <u>aishwaryasahoo@Aishwaryas-MacBook-Air</u> spring24-lab2-mitalee18-aishwaryax % docker-compose up
  0.0s
Attaching to catalog-1, frontend-1, order-1 order-1 | The Order server is running.
                           The Catalog server is running.

Starting server on spring24-lab2-mitalee18-aishwaryax-frontend-1:56363

192.168.65.1 - [03/Apr/2024 02:51:27] "GET /products/Tux HTTP/1.1" 200 - Order received for toy: Tux and for quantity: 1

Order has been processed with OrderNumber 5
 catalog-1
 frontend-1 frontend-1
                           Order processed for toy: Tux and for quantity: 1
192.168.65.1 - - [03/Apr/2024 02:51:40] "POST /orders HTTP/1.1" 200 -
 frontend-1
```

```
aishwaryasahoo@Aishwaryas-MacBook-Air spring24-lab2-mitalee18-aishwaryax % curl http://localhost:56363/products/Tux {"data": {"name": "Tux", "price": 2555.0, "quantity": 2942}} aishwaryasahoo@Aishwaryas-MacBook-Air spring24-lab2-mitalee18-aishwaryax % curl -X POST -d '{ "name": "Tux", "quantity": 1 }' -H "Content-Type: application/json" http://localhost:56363/orders

{"data": {"order_number": 4}} aishwaryas-MacBook-Air spring24-lab2-mitalee18-aishwaryax % docker-compose down
[+] Running 4/4

Container spring24-lab2-mitalee18-aishwaryax-frontend-1 Removed

Container spring24-lab2-mitalee18-aishwaryax-order-1 Removed

Container spring24-lab2-mitalee18-aishwaryax-catalog-1 Removed

Container spring24-lab2-mitalee18-aishwaryax-default

Aishwaryasahoo@Aishwaryas-MacBook-Air spring24-lab2-mitalee18-aishwaryax % curl http://localhost:56363/products/Tux {"data": {"name": "Tux", "price": 2555.0, "quantity": 2941}} aishwaryasahoo@Aishwaryas-MacBook-Air spring24-lab2-mitalee18-aishwaryax % curl -X POST -d '{ "name": "Tux", "quantity": 1 }' -H "Content-Type: application/json" http://localhost:56363/orders

{"data": {"order_number": 5}}
```