



**An-Najah National University  
Faculty of Engineering Information Technology  
Computer Engineering Department**

**Distributed and Operating  
Systems Assignment**

**Supervisor  
Dr.Samer Arandi**

**Student Name:**

**Zahi Abu Shalbak**

**Hadi Irshid**

# Bazar.com MicrowebServices

As requested we have built 3 separate webservices using Flask. The services are running on separate containers. To save time we have also used Docker Compose to build and run the services. To use the services run this command in the project directory `sudo docker-compose -f compose.yaml up --build`.

## Catalog Microservice

The catalog microservice is the backbone of the project. The gateway and the purchase API rely on it. The service simply queries the database using a book number or a topic and in addition to that updates a book's price or its stock count. We have used SQLite for the database in the catalog and purchase services.

The service has 2 endpoints

`PATCH http://172.17.0.1:5050/update`

```
{  
  "item_number":string,  
  "cost":float/decimal (optional),  
  "stcok_count":integer (optional),  
}
```

which updates an item's price or stock count (changes the value by the `stock_count` field up or down) or its price. The endpoint can update one or two fields but not none.

`GET http://172.17.0.1:5050/query?item_number=string&topic=string`

This endpoint receives one of the parameters[specified above (but not booth) and performs a query based on their values. If the topic parameter is present then all the books related to the topic is returned if the item number is present then the item is returned.

if an item or a topic does not exist the response will be something like this

```
{"error":"Something went wrong,make sure that topic/item_number  
{topic/item_number} exists"} 404
```

if a field or a parameter is missing or if something went wrong then the response would be:

```
{"message": "Invalid query parameters"} , {"message": "No query string found  
in the request"}, {"message": "Invalid request data or missing item number"}
```

A better design approach would be using POST for the query endpoint instead of GET .This allows for more fields to be used in the query and for a shorter more readable endpoint.

## Purchase Microservice

We built this service API for handling the purchase orders based on the item number. It depends on the catalog server for searching about if the book exists in the database and for decrementing the stock count by one. and register the order on its own database using sqlite.

The service has one endpoint

**GET 172.17.0.1:5060/purchase/<ItemNum>**

First the service send a request to catalog API for searching about the book based on its item number using this link

**GET <http://172.17.0.1:5050/query>**

**if some error occurred the response will be this json message**

```
{  
'error': 'Failed to fetch data'  
}
```

**If the book is out of stock the response will be like that**

```
{  
'purchase' : "this book is out of stock"  
}
```

**Then if the book exists the API sends an update request for decrementing the stock count by one using this link**

**Patch <http://172.17.0.1:5050/update>**

```
{  
'stock_count' : -1  
  
, 'item_number' : data['ItemNumber']}  
}
```

**Now if the purchase go successfully it response like that**

```
{  
  'message' : 'successfully purchased number =' + ItemNum  
}
```

**otherwise if its failed the response will be :-**

```
{  
  'message' : 'failure purchased number =' + ItemNum  
}
```

## **Frontend Microservice**

This service is used in order to link the request into the proper microservice whether it is catalog server or purchase server using this endpoint format.

`http://172.17.0.1:8080/`

And Here are all the possible requests we can do to our project (using postman)

a-catalog server directly

HTTP <http://127.0.0.1:5050/update>

PATCH <http://127.0.0.1:5050/update>

Send

Params Authorization Headers (9) Body **Body** Pre-request Script Tests Settings Cookies Beautify

none form-data x-www-form-urlencoded raw binary JSON

```
1 {"item_number":1,"count":-1}
```

Body Cookies Headers (5) Test Results Status: 400 BAD REQUEST Time: 4 ms Size: 233 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "message": "Invalid request data or missing item number"
```

HTTP <http://127.0.0.1:5050/update>

PATCH <http://127.0.0.1:5050/update>

Send

Params Authorization Headers (9) Body **Body** Pre-request Script Tests Settings Cookies Beautify

none form-data x-www-form-urlencoded raw binary JSON

```
1 {"stock_count":-1}
```

Body Cookies Headers (5) Test Results Status: 400 BAD REQUEST Time: 4 ms Size: 233 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "message": "Invalid request data or missing item number"
```

HTTP <http://127.0.0.1:5050/query?subject=undergraduate school>

GET http://127.0.0.1:5050/query?subject=undergraduate school

Send

Params • Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 400 BAD REQUEST Time: 4 ms Size: 214 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "message": "Invalid query parameters"
```

HTTP <http://127.0.0.1:5050/query?topic=undergraduate school>

GET http://127.0.0.1:5050/query?topic=undergraduate school

Send

Params • Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 3 ms Size: 293 B Save Response

Pretty Raw Preview Visualize JSON

```
1 [
2   {
3     "id": 3,
4     "title": "Xen and the Art of Surviving Undergraduate School"
5   },
6   {
7     "id": 4,
8     "title": "Cooking for the Impatient Undergrad"
9   }
10 ]
```

HTTP [http://127.0.0.1:5050/query?item\\_number=1](http://127.0.0.1:5050/query?item_number=1)

GET [http://127.0.0.1:5050/query?item\\_number=1](http://127.0.0.1:5050/query?item_number=1) Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 4 ms Size: 253 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "price": 36,
2 "quantity": 3,
3 "title": "How to get a good grade in DOS in 40 minutes a day"
```

HTTP <http://127.0.0.1:5050/update>

PATCH <http://127.0.0.1:5050/update> Send

Params Authorization Headers (9) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary JSON

1 {"item\_number":1,"stock\_count":-1}

Body Cookies Headers (5) Test Results Status: 200 OK Time: 14 ms Size: 210 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "message": "Updated record 1 successfully"
```

HTTP <http://127.0.0.1:8080/info/1>

GET <http://127.0.0.1:8080/info/>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

None form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 6 ms Size: 253 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {  
2   "price": 36,  
3   "quantity": 3,  
4   "title": "How to get a good grade in DOS in 40 minutes a day"  
5 }
```

HTTP <http://127.0.0.1:8080/purchase/8>

POST <http://127.0.0.1:8080/purchase/8>

Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

None form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 11 ms Size: 207 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {  
2   "message": "failed to purchase item 8"  
3 }
```

HTTP <http://127.0.0.1:8080/search/smaple topic>

GET <http://127.0.0.1:8080/search/smaple topic>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 6 ms Size: 240 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "error": "Something went wrong,make sure that topic smaple topic exists"
```

HTTP <http://127.0.0.1:8080/info/6>

GET <http://127.0.0.1:8080/info/6>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 8 ms Size: 228 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "error": "Something went wrong,make sure that item 6 exists"
```

HTTP <http://127.0.0.1:8080/info/1>

GET <http://127.0.0.1:8080/info/1>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 8 ms Size: 253 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "price": 36,
2 "quantity": 4,
3 "title": "How to get a good grade in DOS in 40 minutes a day"
4
5
```

HTTP <http://127.0.0.1:8080/purchase/1>

POST <http://127.0.0.1:8080/purchase/1>

Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 40 ms Size: 210 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "message": "successfully purchased item 1"
2
3
```

HTTP <http://127.0.0.1:8080/info/1>

GET <http://127.0.0.1:8080/info/1>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 6 ms Size: 253 B Save Response

Pretty Raw Preview Visualize JSON

```
1
2   "price": 36,
3   "quantity": 5,
4   "title": "How to get a good grade in DOS in 40 minutes a day"
5
```

HTTP <http://127.0.0.1:8080/search/undergraduate school>

GET <http://127.0.0.1:8080/search/undergraduate school>

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 6 ms Size: 293 B Save Response

Pretty Raw Preview Visualize JSON

```
1 [
2   {
3     "id": 3,
4     "title": "Xen and the Art of Surviving Undergraduate School"
5   },
6   {
7     "id": 4,
8     "title": "Cooking for the Impatient Undergrad"
9   }
10]
```

HTTP <http://127.0.0.1:8080/search/distributed systems>

GET <http://127.0.0.1:8080/search/distributed systems>

Save [Save](#) [Copy](#)

Send [Send](#)

Params Authorization Headers (7) **Body** Pre-request Script Tests Settings Cookies

None form-data x-www-form-urlencoded raw binary

This request does not have a body

Body Cookies Headers (5) Test Results Status: 200 OK Time: 5 ms Size: 273 B Save Response

Pretty Raw Preview Visualize JSON

```
1 [ { 2   "id": 1, 3     "title": "How to get a good grade in DOS in 40 minutes a day" 4 }, 5   { 6     "id": 2, 7       "title": "RPCs for Noobs" 8 } 9 ] 10 ]
```