An-Najah National University

Faculty of Engineering

Department of Computer Engineering

Distributed and Operating Systems

Bazar.com: A Multi-tier Online Book Store

Team members:

Hamzi damide (11612453)

Dania Aqel(11642509)

Chapter 1: Overview

We use lumen framework on Ubntu Virtual Machine , to run our application you must dawnload Oracle VM VirtualBox , then made 5 VM's inside it :

1-Frontend.

2-Catalouge Server.

3-Order Server.

4--Rorder Server

5- Rcatalouge Server.

Then we install Ubntu inside each VM, then install Vscode and lumen php, after that we start writing code, we make network to communication between VM's

1.Frontend:192.168.1.7.

2.Catalouge server:192.168.1.5.

3-Order Server:192.168.1.6.

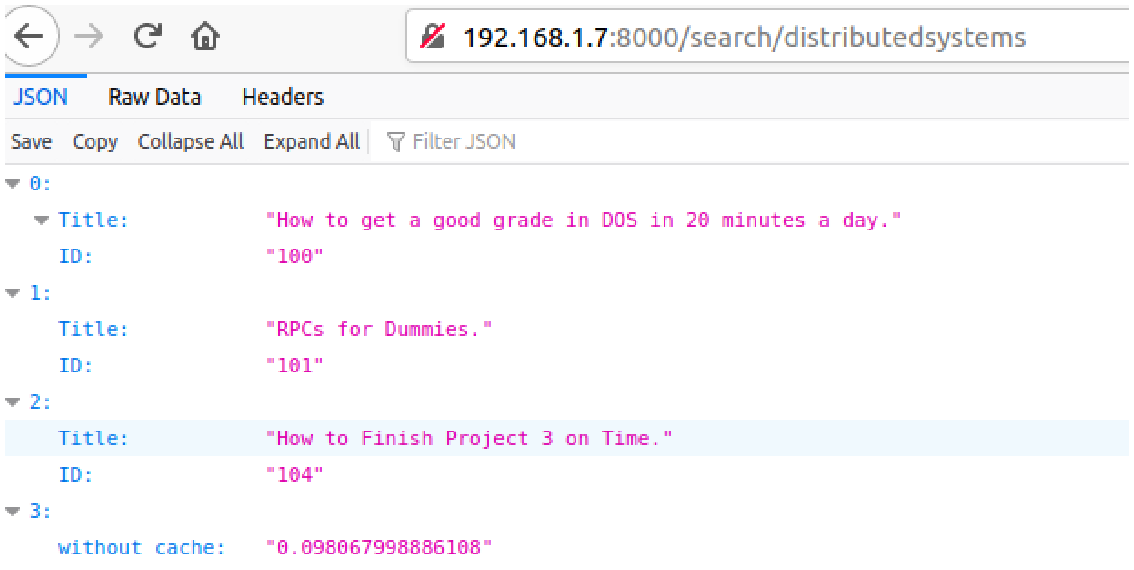
4-RCataloug Server:192.168.1.4.

5-Rorder Server:192.168.1.8.

Chapter 2: Output Cashe without Replication:

1-Successful Search:

a-without cache and without replication distributedsystems



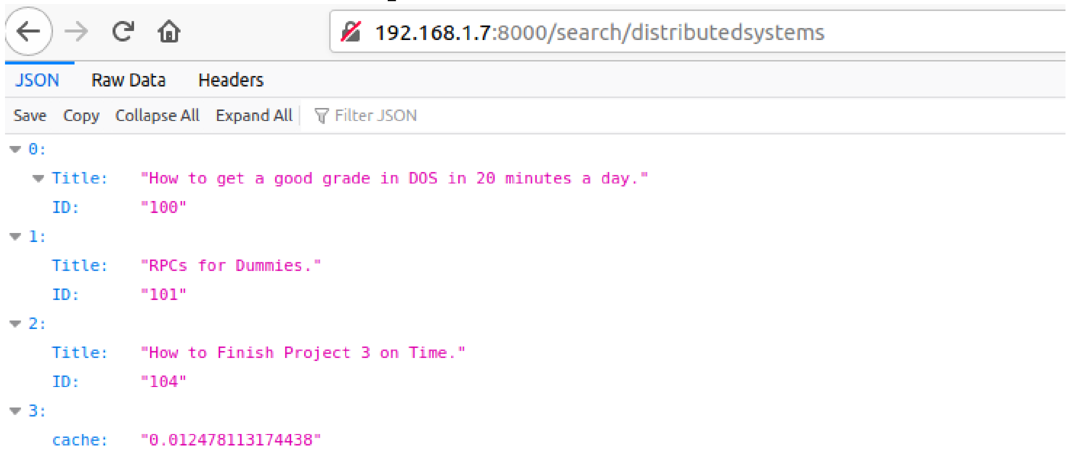
192.168.1.7:8000/search/distributedsystems

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
  ▼ Title:          "How to get a good grade in DOS in 20 minutes a day."
    ID:             "100"
▼ 1:
    Title:          "RPCs for Dummies."
    ID:             "101"
▼ 2:
    Title:          "How to Finish Project 3 on Time."
    ID:             "104"
▼ 3:
    without cache:  "0.098067998886108"
```

b-with cache and without replication



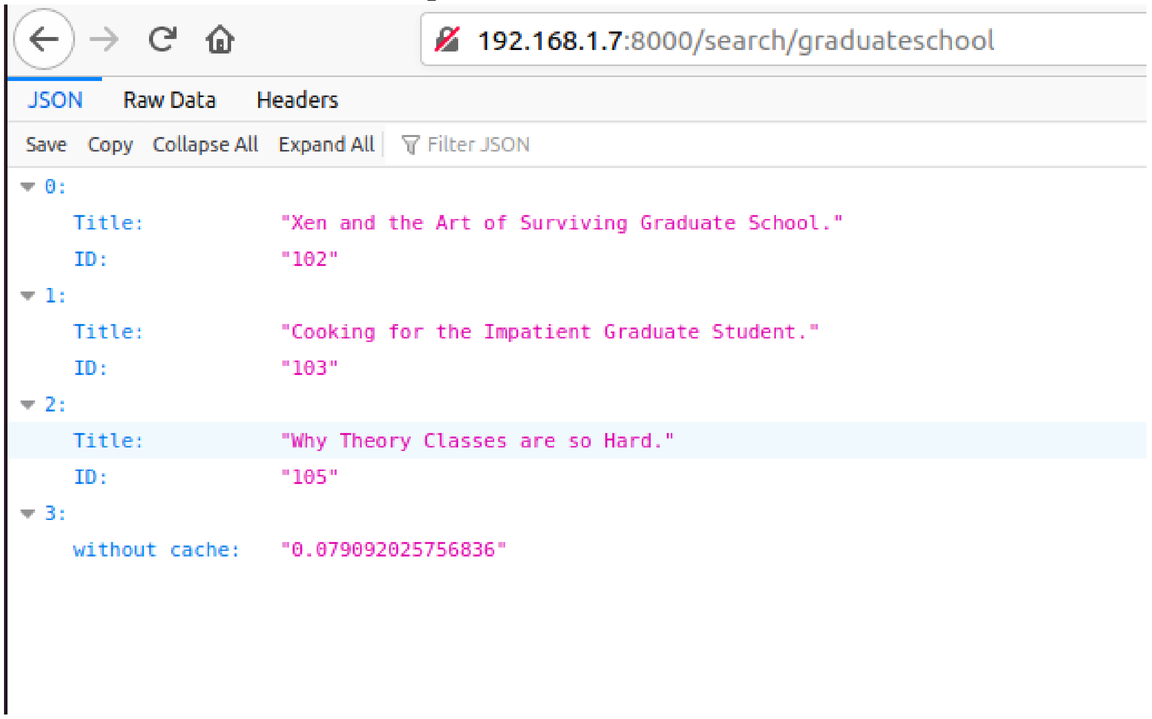
192.168.1.7:8000/search/distributedsystems

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
  ▼ Title:   "How to get a good grade in DOS in 20 minutes a day."
    ID:      "100"
▼ 1:
    Title:   "RPCs for Dummies."
    ID:      "101"
▼ 2:
    Title:   "How to Finish Project 3 on Time."
    ID:      "104"
▼ 3:
    cache:   "0.012478113174438"
```

c-without cache and without replication graduate school



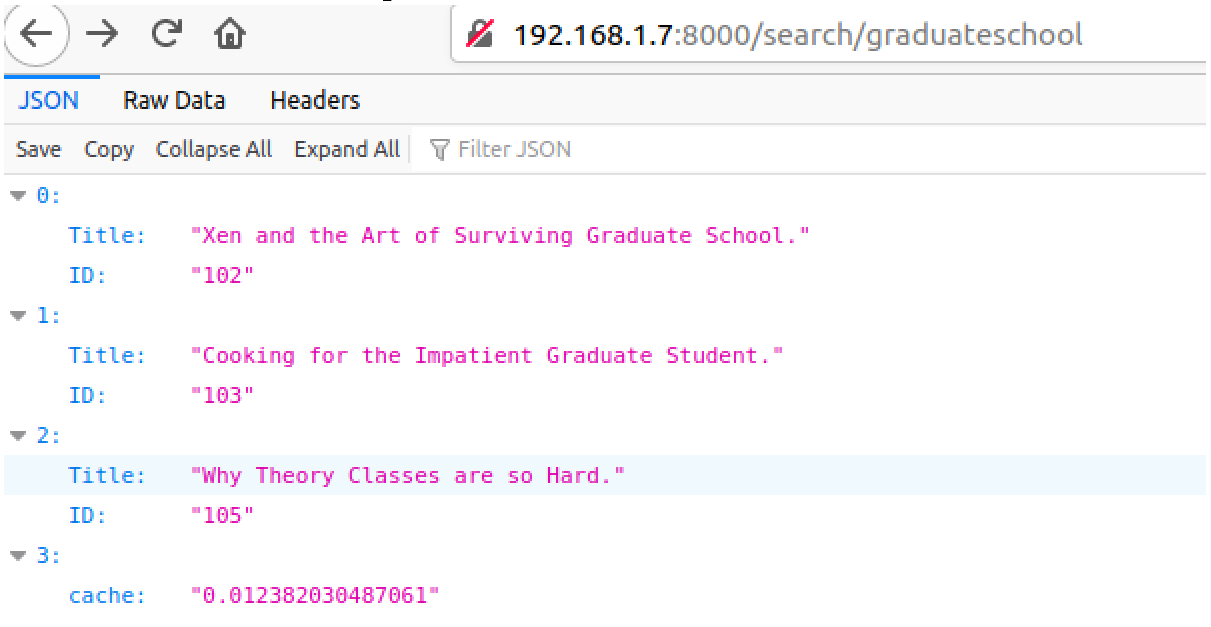
192.168.1.7:8000/search/graduateschool

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
    Title:          "Xen and the Art of Surviving Graduate School."
    ID:             "102"
▼ 1:
    Title:          "Cooking for the Impatient Graduate Student."
    ID:             "103"
▼ 2:
    Title:          "Why Theory Classes are so Hard."
    ID:             "105"
▼ 3:
    without cache:  "0.079092025756836"
```

c-with cache and without replication graduateschool



192.168.1.7:8000/search/graduateschool

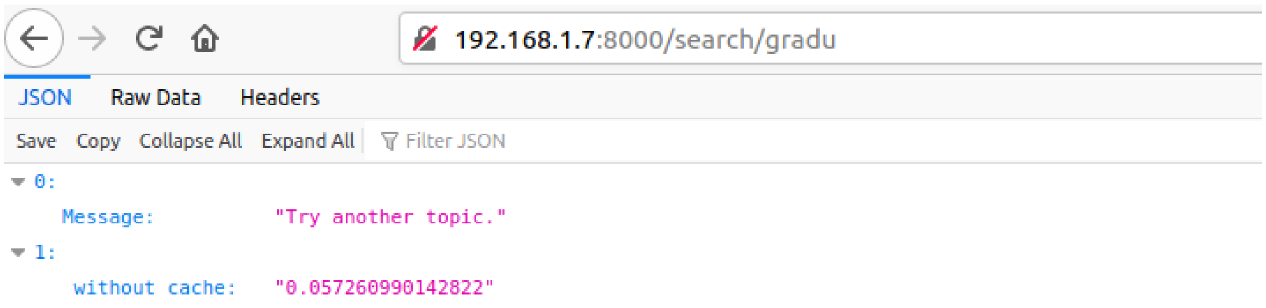
JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
    Title:   "Xen and the Art of Surviving Graduate School."
    ID:      "102"
▼ 1:
    Title:   "Cooking for the Impatient Graduate Student."
    ID:      "103"
▼ 2:
    Title:   "Why Theory Classes are so Hard."
    ID:      "105"
▼ 3:
    cache:   "0.012382030487061"
```

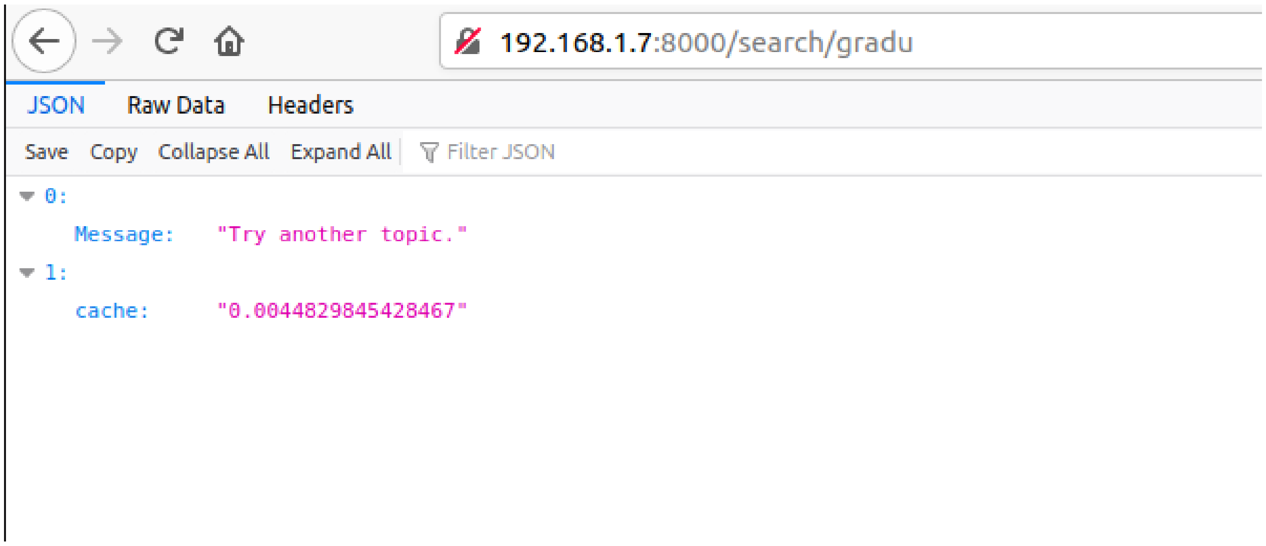
2-UnSuccessful Search:

a-Without cahce:


192.168.1.7:8000/search/gradu

```
0:
    Message:         "Try another topic."
1:
    without cache:   "0.057260990142822"
```

b-With Cache :

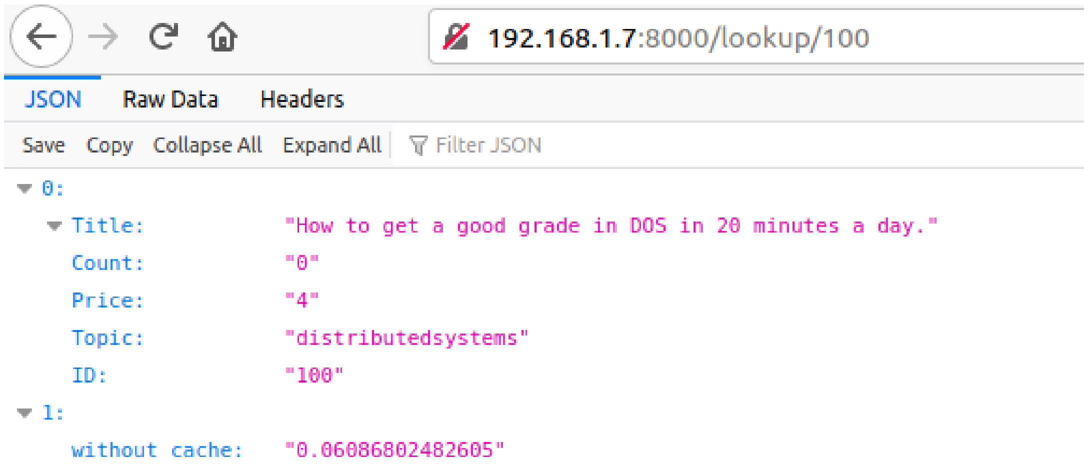

192.168.1.7:8000/search/gradu

```
0:
    Message:   "Try another topic."
1:
    cache:     "0.0044829845428467"
```

Lookup:

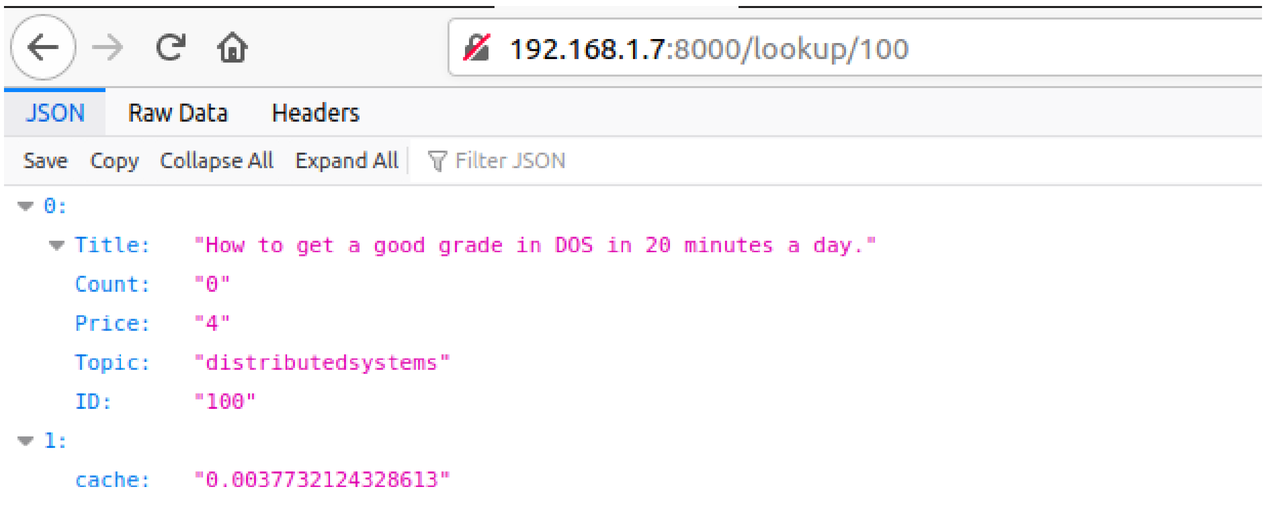
1-successful lookup

a-without cache and without Replication:



```
▼ 0:
  ▼ Title:          "How to get a good grade in DOS in 20 minutes a day."
    Count:          "0"
    Price:          "4"
    Topic:          "distributedsystems"
    ID:             "100"
▼ 1:
    without cache:  "0.06086802482605"
```

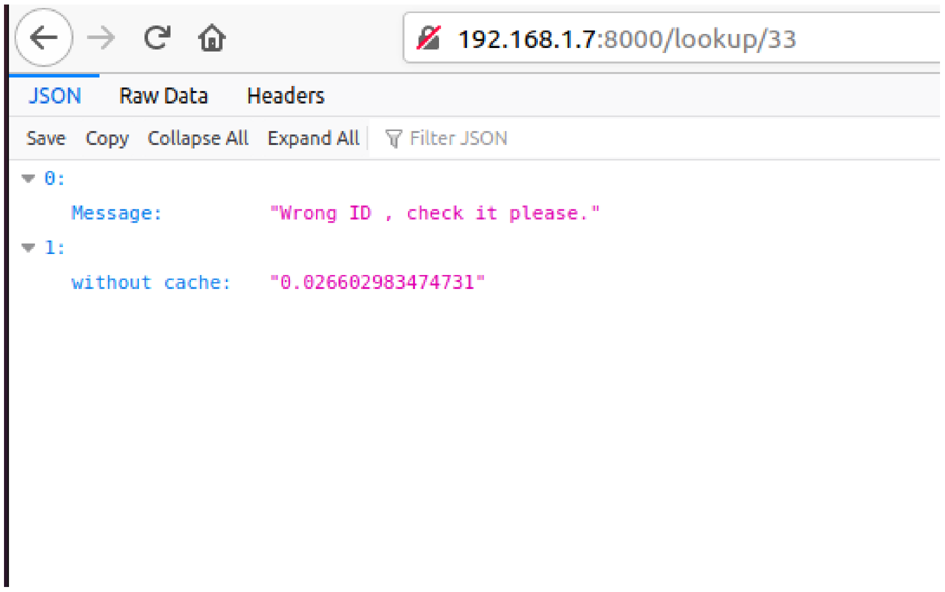
b-with cache and without Replication:



```
▼ 0:
  ▼ Title:   "How to get a good grade in DOS in 20 minutes a day."
    Count:   "0"
    Price:   "4"
    Topic:   "distributedsystems"
    ID:      "100"
▼ 1:
    cache:   "0.0037732124328613"
```

2- Unsuccessful lookup

a-without cache and without Replication:



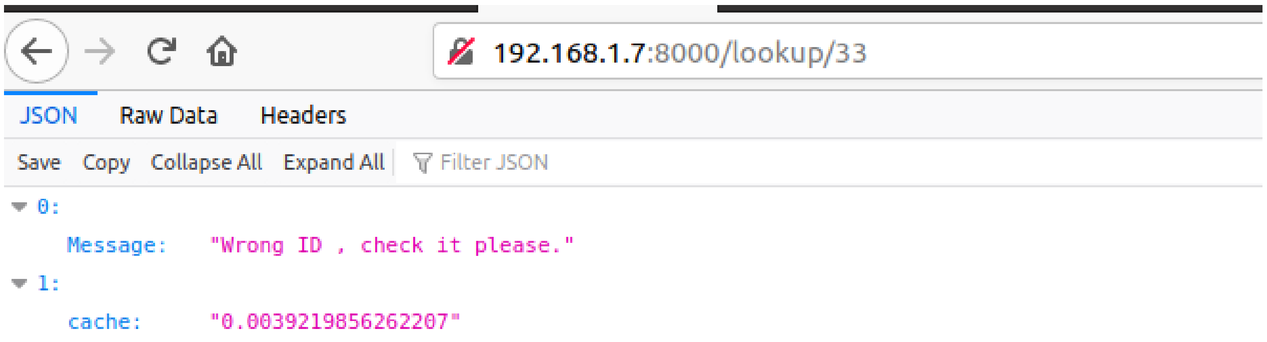
192.168.1.7:8000/lookup/33

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
    Message:         "Wrong ID , check it please."
▼ 1:
    without cache:   "0.026602983474731"
```

b-with cache and without Replication:



192.168.1.7:8000/lookup/33

JSON Raw Data Headers

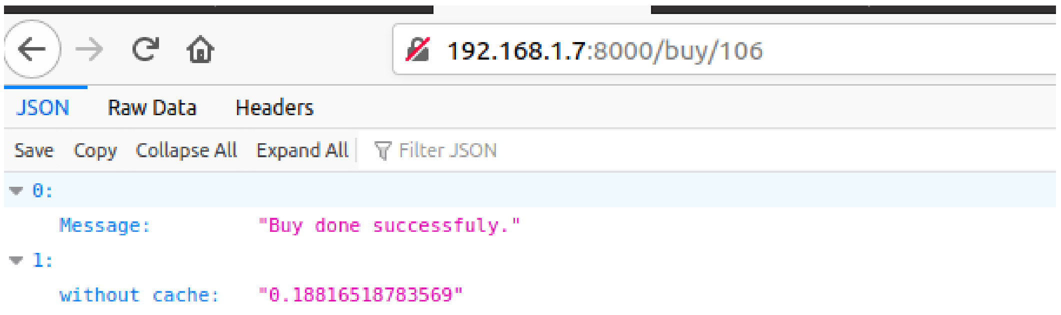
Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
    Message:   "Wrong ID , check it please."
▼ 1:
    cache:     "0.0039219856262207"
```

Buy:

1-successful buy

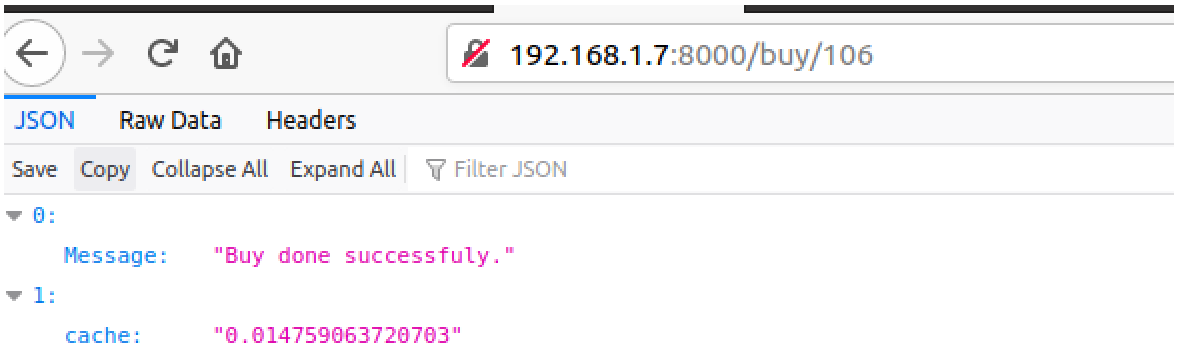
a-without cache and without Replication:



192.168.1.7:8000/buy/106

```
0:
    Message:        "Buy done successfuly."
1:
    without cache:  "0.18816518783569"
```

b-with cache and without Replication:

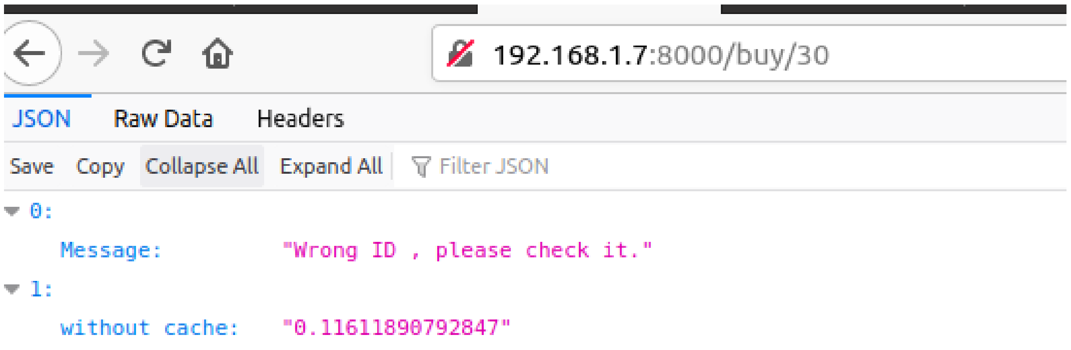


192.168.1.7:8000/buy/106

```
0:
    Message:   "Buy done successfuly."
1:
    cache:     "0.014759063720703"
```

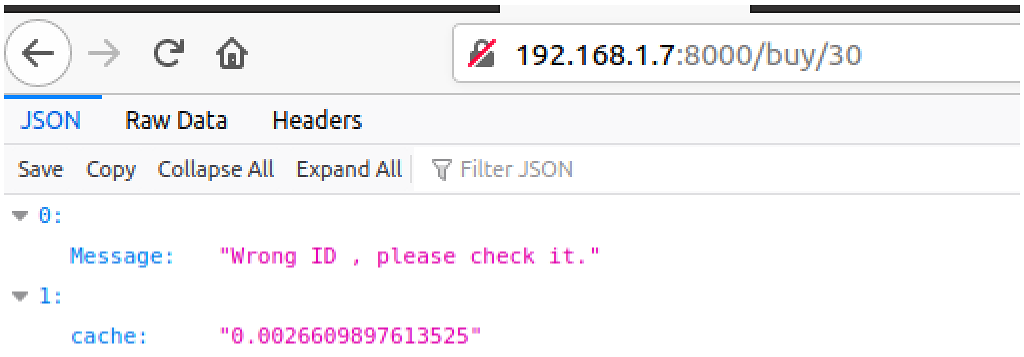
1-Unsuccessful buy

a-without cache and without Replication:



```
▼ 0:
    Message:        "Wrong ID , please check it."
▼ 1:
    without cache:  "0.11611890792847"
```

a-with cache and without Replication:



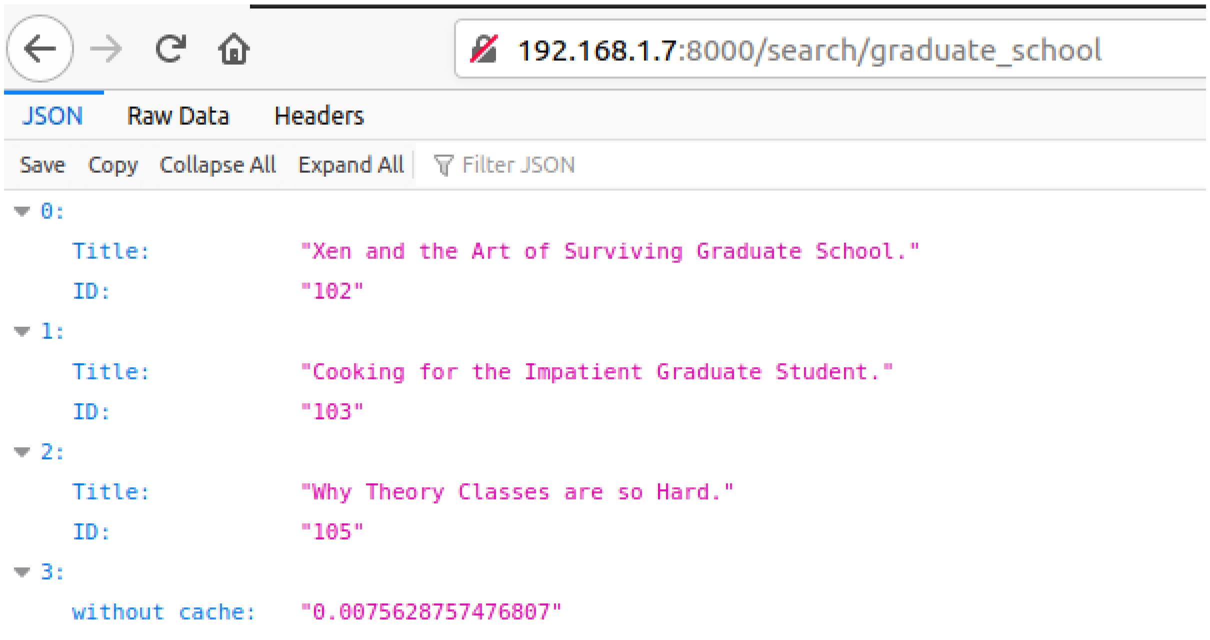
```
▼ 0:
    Message:   "Wrong ID , please check it."
▼ 1:
    cache:     "0.0026609897613525"
```

Chapter 3: Output Cashe and Replication:

1.Search: which is Topic based search, it is just return the title book and it's number of item. It is catalogue server responsibility, so the front-end server send query to the catalogue server and then display the response we will show it with cache and without cache:

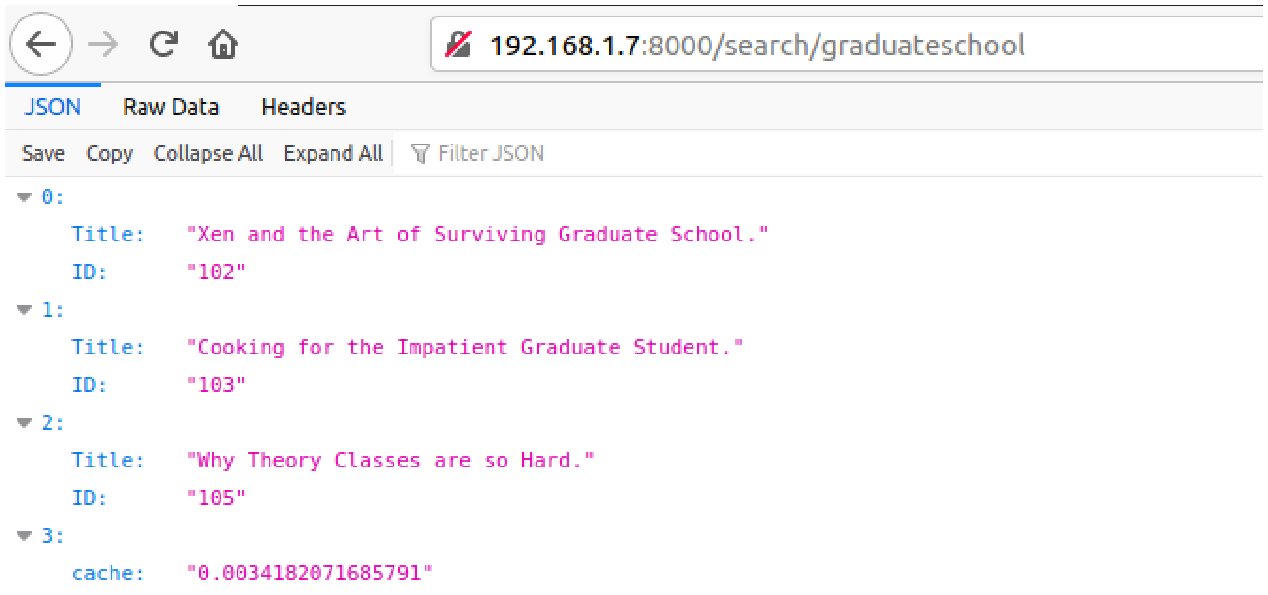
1-Successful Search without Cache:

a-Successful search for graduatedschool topic search without Cache:



```
▼ 0:
    Title:          "Xen and the Art of Surviving Graduate School."
    ID:             "102"
▼ 1:
    Title:          "Cooking for the Impatient Graduate Student."
    ID:             "103"
▼ 2:
    Title:          "Why Theory Classes are so Hard."
    ID:             "105"
▼ 3:
    without cache:  "0.0075628757476807"
```

b-Successful search for graduatedschool topic search with Cache:

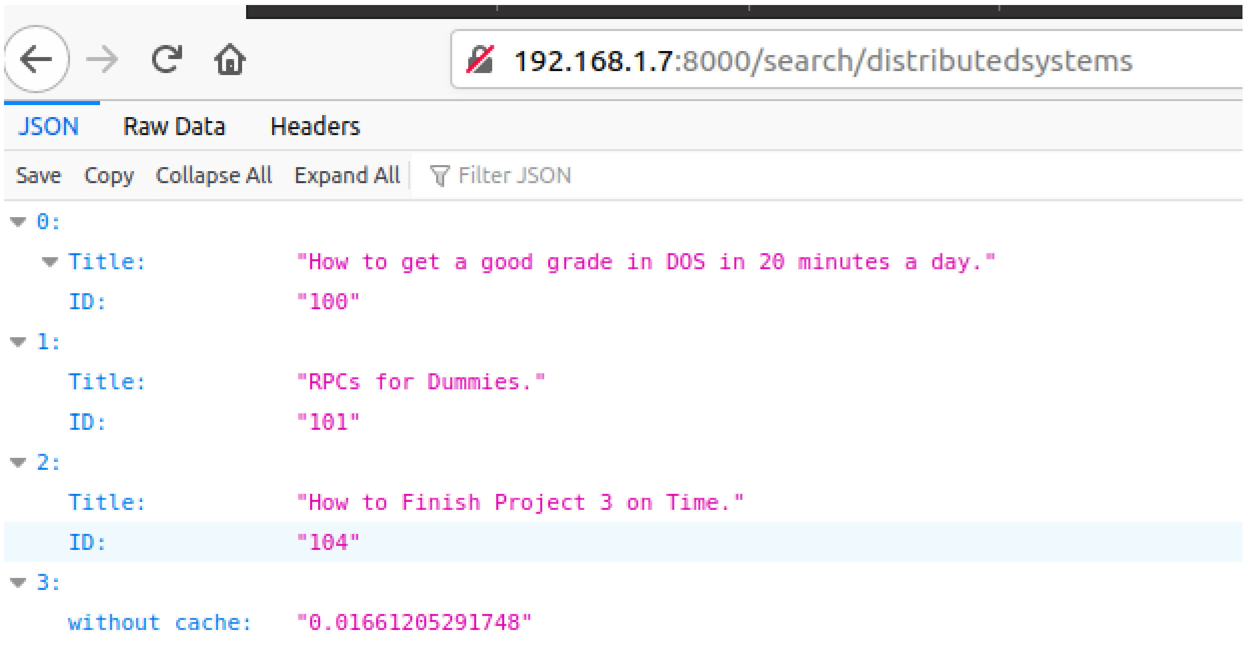

192.168.1.7:8000/search/graduateschool

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
0:
   Title:   "Xen and the Art of Surviving Graduate School."
   ID:      "102"
1:
   Title:   "Cooking for the Impatient Graduate Student."
   ID:      "103"
2:
   Title:   "Why Theory Classes are so Hard."
   ID:      "105"
3:
   cache:   "0.0034182071685791"
```

c-Successful search for distributedsystem topic search without Cache:

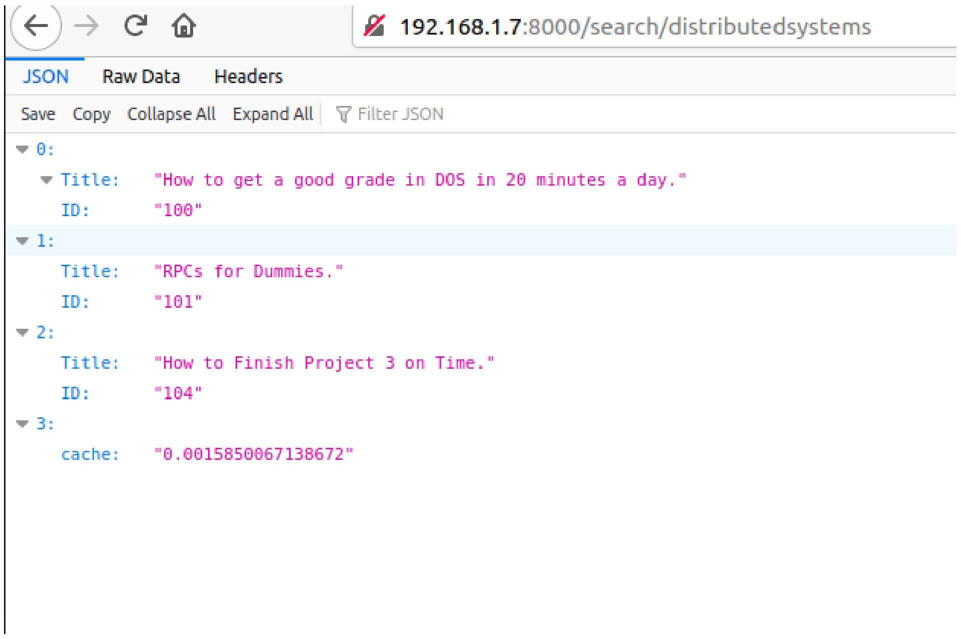

192.168.1.7:8000/search/distributedsystems

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
0:
  Title:          "How to get a good grade in DOS in 20 minutes a day."
   ID:            "100"
1:
   Title:         "RPCs for Dummies."
   ID:            "101"
2:
   Title:         "How to Finish Project 3 on Time."
   ID:            "104"
3:
   without cache: "0.01661205291748"
```

d-Successful search for distributedsystem topic search with Cache:

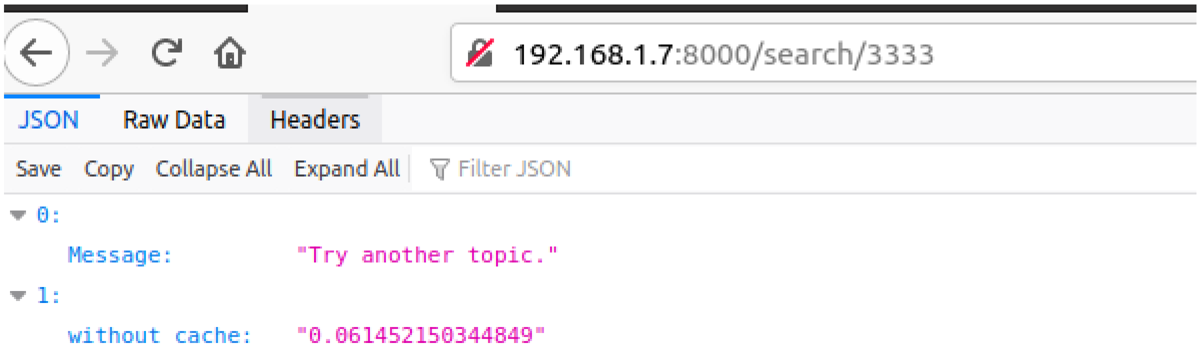


192.168.1.7:8000/search/distributedsystems

```
0:
  Title:   "How to get a good grade in DOS in 20 minutes a day."
  ID:      "100"
1:
  Title:   "RPCs for Dummies."
  ID:      "101"
2:
  Title:   "How to Finish Project 3 on Time."
  ID:      "104"
3:
  cache:   "0.0015850067138672"
```

2-Unsuccessful Search:

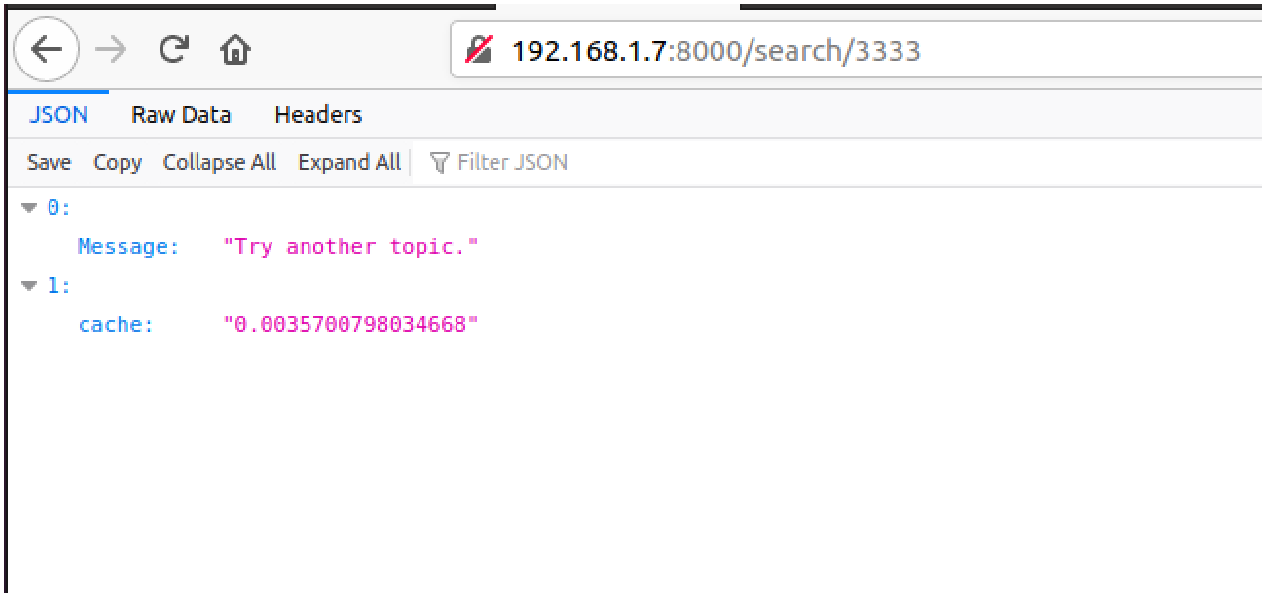
a-unsuccessful search without cache



192.168.1.7:8000/search/3333

```
0:
  Message:         "Try another topic."
1:
  without cache:   "0.061452150344849"
```

a-unsuccessful search with cache

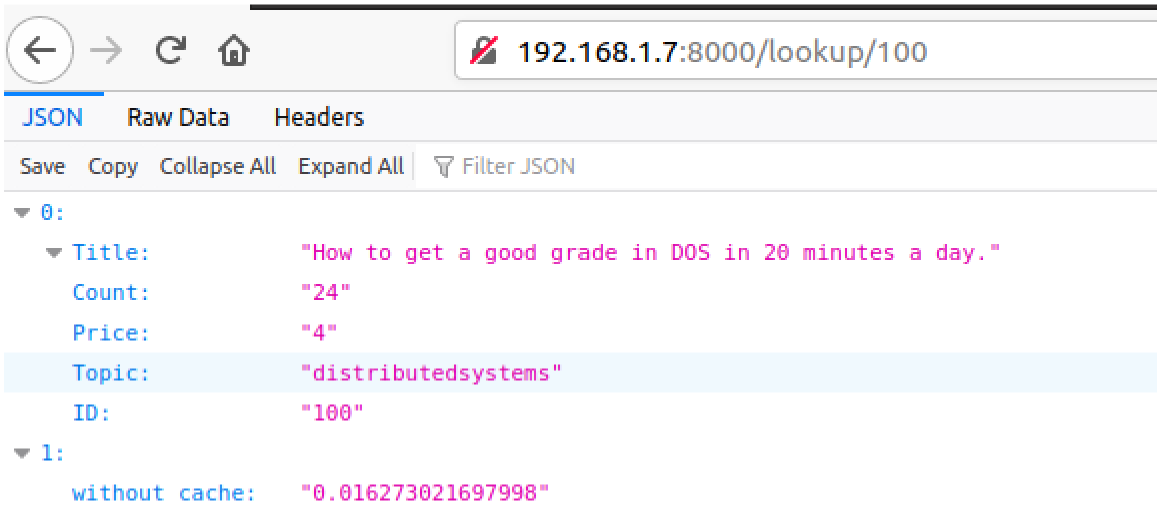


```
▼ 0:
    Message:    "Try another topic."
▼ 1:
    cache:      "0.0035700798034668"
```

2.Lookup: which is ID based lookup, it is just return the number of books and it's cost,and the rest of information. It is catalogue server responsibility, so the front-end server send query to the catalogue server and then display the response :

1-Sucessful LookUp:

a-book is exist without cache:



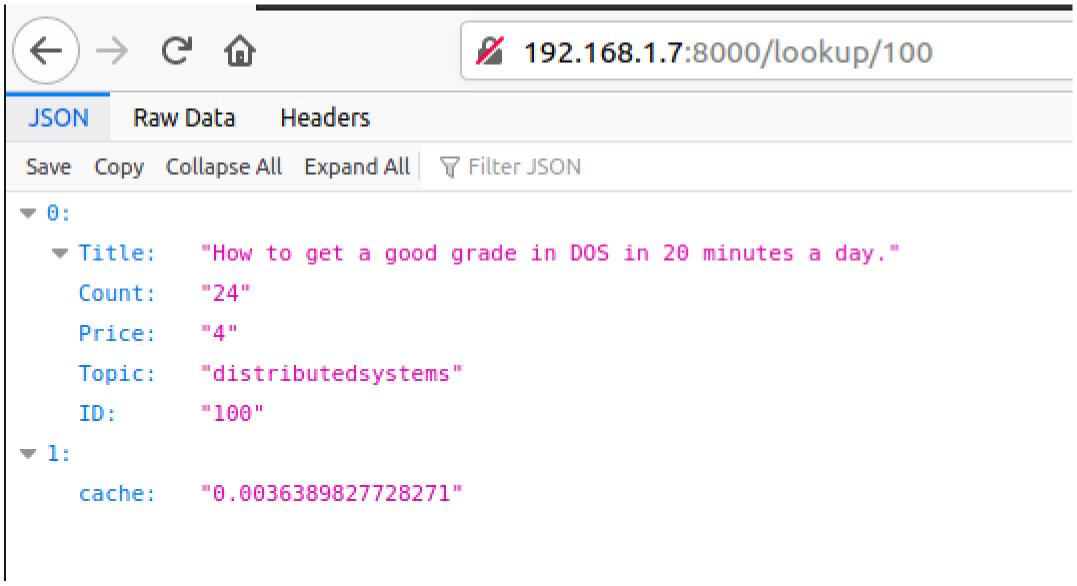
192.168.1.7:8000/lookup/100

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
  ▼ Title:         "How to get a good grade in DOS in 20 minutes a day."
    Count:         "24"
    Price:         "4"
    Topic:         "distributedsystems"
    ID:            "100"
▼ 1:
    without cache: "0.016273021697998"
```

b- **a-book is exist with cache:**



192.168.1.7:8000/lookup/100

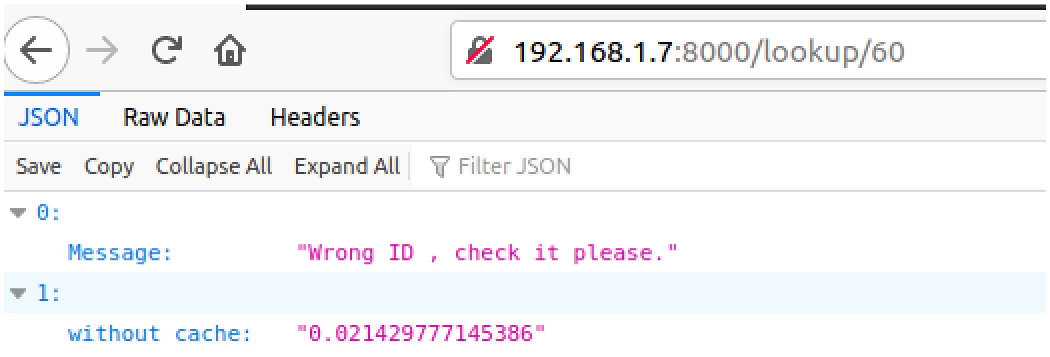
JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
▼ 0:
  ▼ Title:   "How to get a good grade in DOS in 20 minutes a day."
    Count:   "24"
    Price:   "4"
    Topic:   "distributedsystems"
    ID:      "100"
▼ 1:
    cache:   "0.0036389827728271"
```

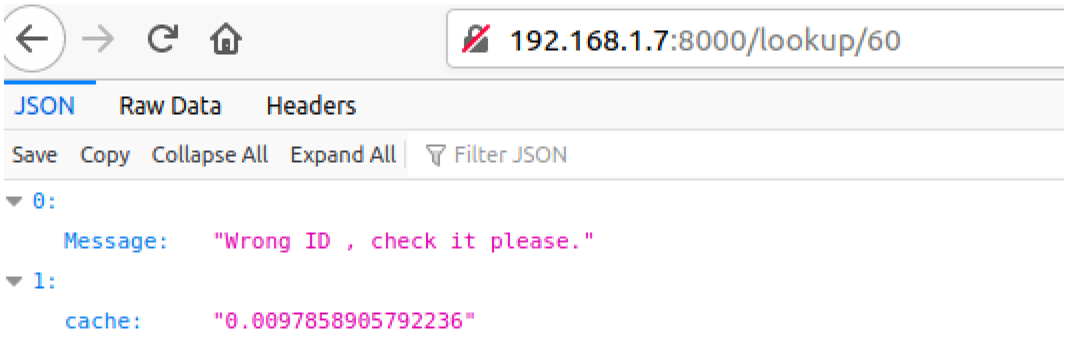
2-UnSucessful LookUp:

a-book does not exist without cache



```
0:
    Message:        "Wrong ID , check it please."
1:
    without cache:  "0.021429777145386"
```

b-book does not exist with cache:

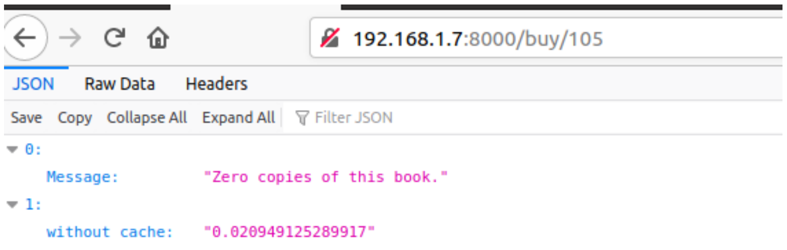


```
0:
    Message:  "Wrong ID , check it please."
1:
    cache:    "0.0097858905792236"
```

3.Buy: which is ID based buy. This operation is go through all servers. Front-end send buy query to order server and then order server send two consecutive queries to catalogue server, the first to check if the book exist and have adequate copies for purchase if the response is negative then the second query will not be applied, otherwise the number of copies will decremented in the same query and second query will send to stressing the success of process.

1-Successful buy:

a-suceesful buy without cache:



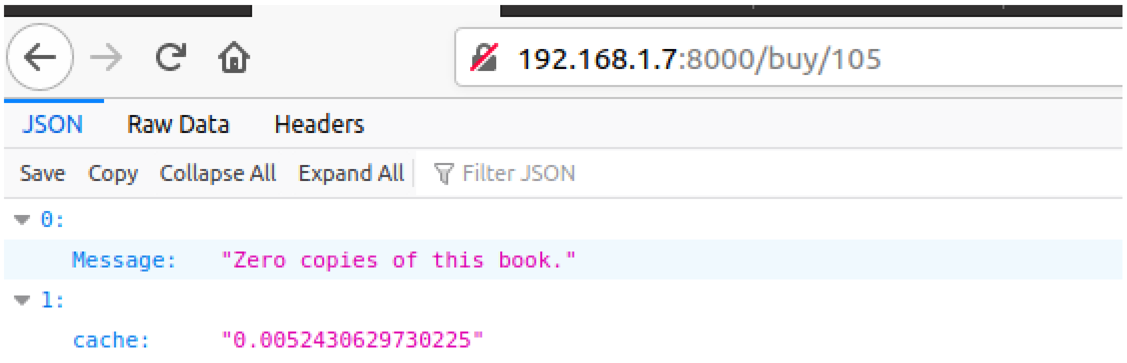
192.168.1.7:8000/buy/105

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
0:
    Message:        "Zero copies of this book."
1:
    without cache:  "0.020949125289917"
```

b-suceesful buy with cache:



192.168.1.7:8000/buy/105

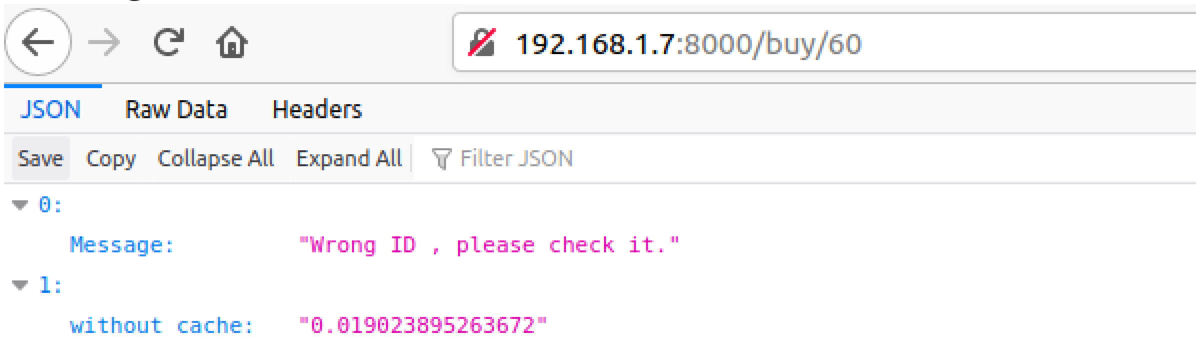
JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

```
0:
    Message:  "Zero copies of this book."
1:
    cache:    "0.0052430629730225"
```

2-Unsuccessful buy:

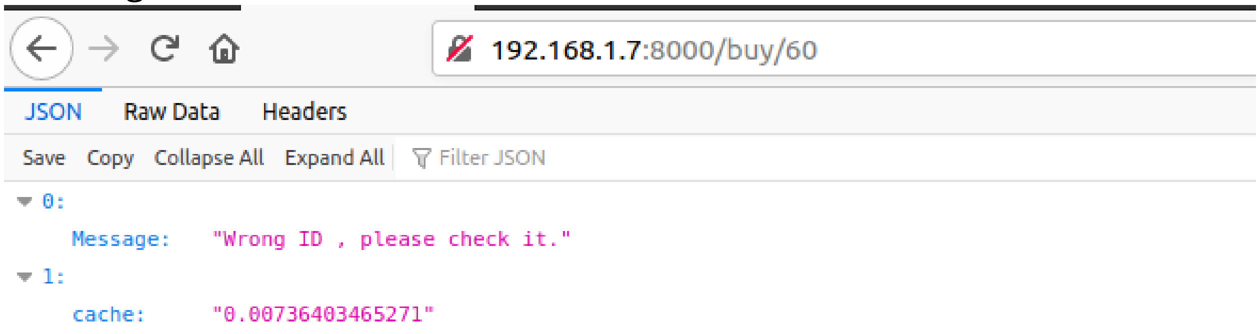
a- wrong Id without cache



192.168.1.7:8000/buy/60

```
0:
    Message:          "Wrong ID , please check it."
1:
    without cache:    "0.019023895263672"
```

a- wrong Id with cache



192.168.1.7:8000/buy/60

```
0:
    Message:   "Wrong ID , please check it."
1:
    cache:     "0.00736403465271"
```