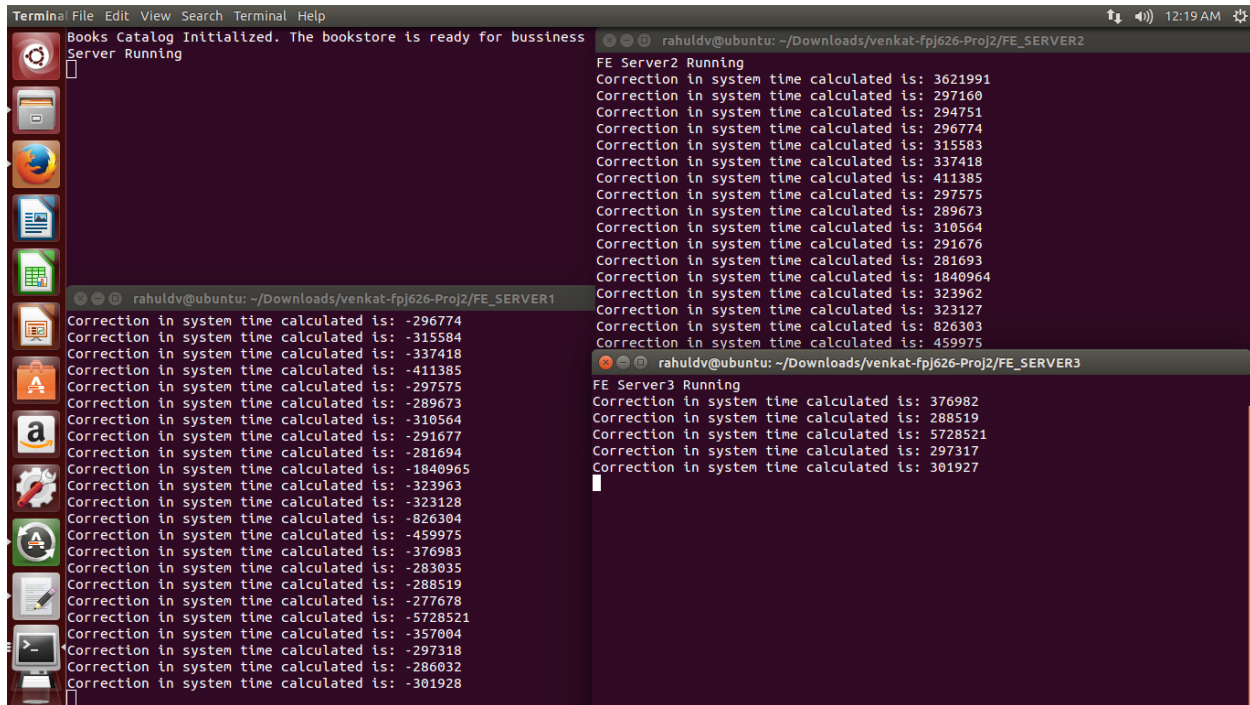


Test Case Design for MyBook.com Project.

Test case1: Clock Synchronization between 2 front end servers and leader front end server.

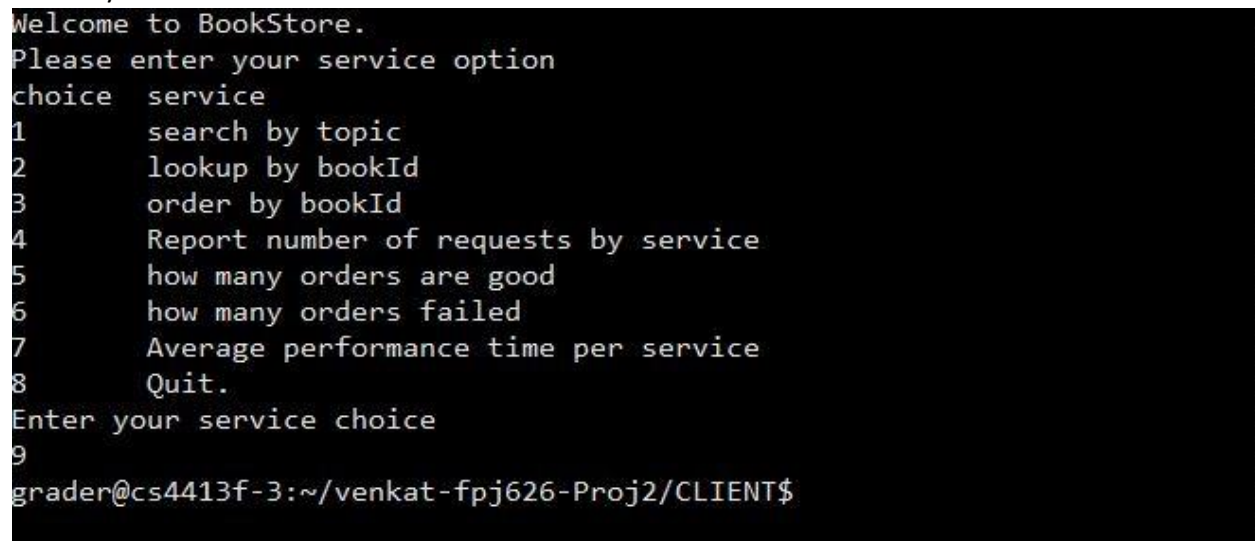


The screenshot shows a terminal window with three separate terminal sessions running. The first session, titled 'Books Catalog Initialized. The bookstore is ready for bussiness Server Running', shows a list of 20 'Correction in system time calculated is:' values for FE_SERVER1. The second session, titled 'FE Server2 Running', shows a list of 20 'Correction in system time calculated is:' values for FE_SERVER2. The third session, titled 'FE Server3 Running', shows a list of 5 'Correction in system time calculated is:' values for FE_SERVER3. All values are in nanoseconds.

```
Terminal File Edit View Search Terminal Help
Books Catalog Initialized. The bookstore is ready for bussiness
Server Running
rahuldv@ubuntu: ~/Downloads/venkat-fpj626-Proj2/FE_SERVER1
Correction in system time calculated is: -296774
Correction in system time calculated is: -315584
Correction in system time calculated is: -337418
Correction in system time calculated is: -411385
Correction in system time calculated is: -297575
Correction in system time calculated is: -289673
Correction in system time calculated is: -310564
Correction in system time calculated is: -291677
Correction in system time calculated is: -281694
Correction in system time calculated is: -1840965
Correction in system time calculated is: -323963
Correction in system time calculated is: -323128
Correction in system time calculated is: -826304
Correction in system time calculated is: -459975
Correction in system time calculated is: -376983
Correction in system time calculated is: -283035
Correction in system time calculated is: -288519
Correction in system time calculated is: -277678
Correction in system time calculated is: -5728521
Correction in system time calculated is: -357004
Correction in system time calculated is: -297318
Correction in system time calculated is: -286032
Correction in system time calculated is: -301928
rahuldv@ubuntu: ~/Downloads/venkat-fpj626-Proj2/FE_SERVER2
FE Server2 Running
Correction in system time calculated is: 3621991
Correction in system time calculated is: 297160
Correction in system time calculated is: 294751
Correction in system time calculated is: 296774
Correction in system time calculated is: 315583
Correction in system time calculated is: 337418
Correction in system time calculated is: 411385
Correction in system time calculated is: 297575
Correction in system time calculated is: 289673
Correction in system time calculated is: 310564
Correction in system time calculated is: 291676
Correction in system time calculated is: 281693
Correction in system time calculated is: 1840964
Correction in system time calculated is: 323962
Correction in system time calculated is: 323127
Correction in system time calculated is: 826303
Correction in system time calculated is: 459975
rahuldv@ubuntu: ~/Downloads/venkat-fpj626-Proj2/FE_SERVER3
FE Server3 Running
Correction in system time calculated is: 376982
Correction in system time calculated is: 288519
Correction in system time calculated is: 5728521
Correction in system time calculated is: 297317
Correction in system time calculated is: 301927
```

The above screen shot showing the correction calculated in nanoseconds.

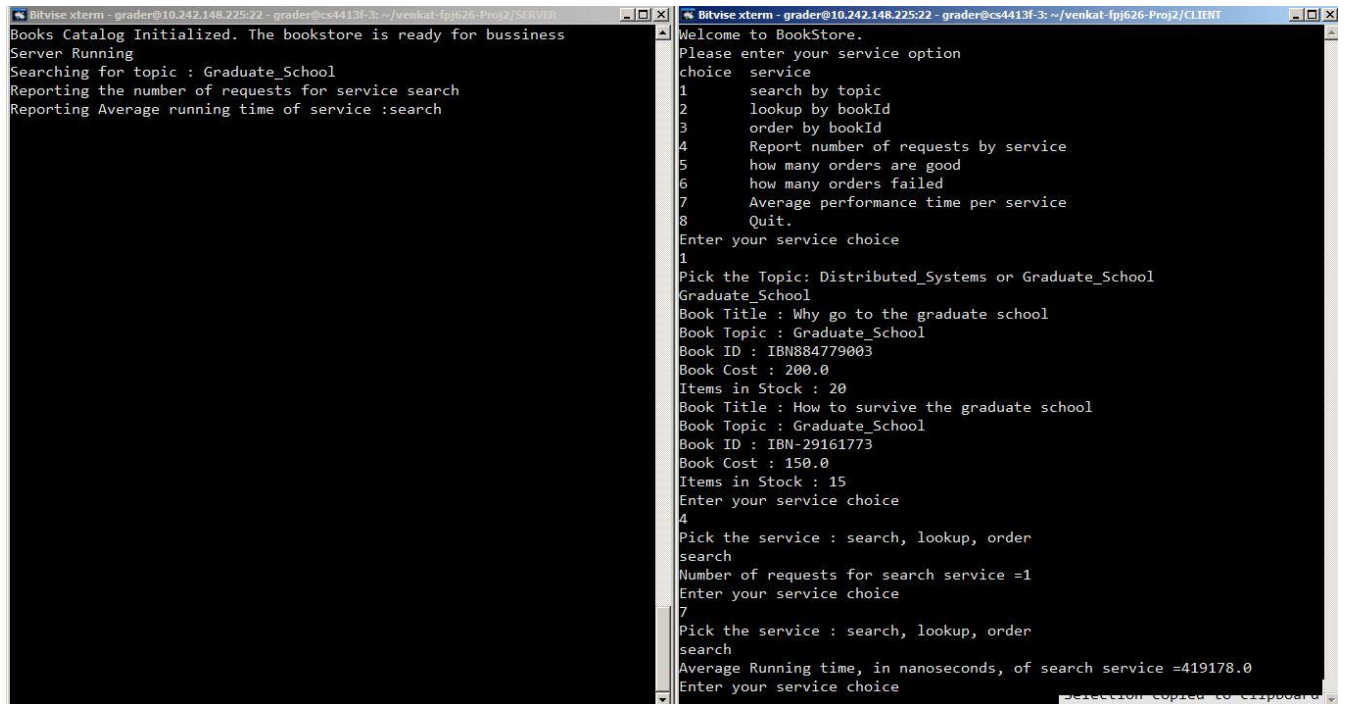
Test case1: If we give any other service option than the one specified. Then the client simply exits normally.



The screenshot shows a terminal window with the BookStore service menu. The user is prompted to enter a service choice. The menu lists 8 options: 1. search by topic, 2. lookup by bookId, 3. order by bookId, 4. Report number of requests by service, 5. how many orders are good, 6. how many orders failed, 7. Average performance time per service, 8. Quit. The user enters '9', which is not a valid option, and the terminal shows the prompt 'grader@cs4413f-3:~/venkat-fpj626-Proj2/CLIENT\$'.

```
Welcome to BookStore.
Please enter your service option
choice service
1 search by topic
2 lookup by bookId
3 order by bookId
4 Report number of requests by service
5 how many orders are good
6 how many orders failed
7 Average performance time per service
8 Quit.
Enter your service choice
9
grader@cs4413f-3:~/venkat-fpj626-Proj2/CLIENT$
```

Test case2: We check the search service functionality. A normal test case that expects appropriate behavior because the inputs are valid. (left is server, right is client)



```
Bitwise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/SERVER
Books Catalog Initialized. The bookstore is ready for bussiness
Server Running
Searching for topic : Graduate_School
Reporting the number of requests for service search
Reporting Average running time of service :search

Bitwise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/CLIENT
Welcome to BookStore.
Please enter your service option
choice service
1 search by topic
2 lookup by bookId
3 order by bookId
4 Report number of requests by service
5 how many orders are good
6 how many orders failed
7 Average performance time per service
8 Quit.
Enter your service choice
1
Pick the Topic: Distributed_Systems or Graduate_School
Graduate_School
Book Title : Why go to the graduate school
Book Topic : Graduate_School
Book ID : IBN884779003
Book Cost : 200.0
Items in Stock : 20
Book Title : How to survive the graduate school
Book Topic : Graduate_School
Book ID : IBN-29161773
Book Cost : 150.0
Items in Stock : 15
Enter your service choice
4
Pick the service : search, lookup, order
search
Number of requests for search service =1
Enter your service choice
7
Pick the service : search, lookup, order
search
Average Running time, in nanoseconds, of search service =419178.0
Enter your service choice
```

Test case3: We order a book and observe an increase in good orders and decrease in number of items in stock. (left is server, right is client)

```
Bitvise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/SEVER
Books Catalog Initialized. The bookstore is ready for bussiness
Server Running
Searching for topic : Graduate_School
Reporting the number of requests for service search
Reporting Average running time of service :search
Searching for topic : Graduate_School
Ordering book with bookId : IBN-29161773
Trying to look up book with bookId : IBN-29161773
Reporting number of Good Orders

Bitvise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/CLIENT
7 Average performance time per service
8 Quit.
Enter your service choice
1
Pick the Topic: Distributed_Systems or Graduate_School
Graduate_School
Book Title : Why go to the graduate school
Book Topic : Graduate_School
Book ID : IBN884779003
Book Cost : 200.0
Items in Stock : 20
Book Title : How to survive the graduate school
Book Topic : Graduate_School
Book ID : IBN-29161773
Book Cost : 150.0
Items in Stock : 15
Enter your service choice
3
Enter the book id you want to ORDER. You may want to search before if you
do not know the book id
IBN-29161773
Book Ordered successfully
Enter your service choice
2
Enter the book id you want to look up. You may want to search before if y
ou do not know the book id
IBN-29161773
Book Title : How to survive the graduate school
Book Topic : Graduate_School
Book ID : IBN-29161773
Book Cost : 150.0
Items in Stock : 14
Enter your service choice
5
The number of Good orders = 1
Enter your service choice
```

Test case4: Simultaneous ordering same book by 2 or more clients. (left: client1, right: client2)

```
Bitvise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/CLIENT
Welcome to BookStore.
Please enter your service option
choice service
1 search by topic
2 lookup by bookId
3 order by bookId
4 Report number of requests by service
5 how many orders are good
6 how many orders failed
7 Average performance time per service
8 Quit.
Enter your service choice
3
Enter the book id you want to ORDER. You may want to search before if you
do not know the book id
IBN-22161773
Book Ordered Failed. Please check Items in stock before ordering
Enter your service choice
3
Enter the book id you want to ORDER. You may want to search before if you
do not know the book id
IBN-29161773
Book Ordered successfully
Enter your service choice
5
The number of Good orders = 3
Enter your service choice

Bitvise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/CLIENT
Welcome to BookStore.
Please enter your service option
choice service
1 search by topic
2 lookup by bookId
3 order by bookId
4 Report number of requests by service
5 how many orders are good
6 how many orders failed
7 Average performance time per service
8 Quit.
Enter your service choice
3
Enter the book id you want to ORDER. You may want to search before if you
do not know the book id
IBN-29161773
Book Ordered successfully
Enter your service choice
```

Test case5: Enter wrong BookId while ordering. Application shows appropriate error message:

```
Bitvise xterm - grader@10.242.148.225:22 - grader@cs4413f-3: ~/venkat-fpj626-Proj2/CLIENT
Welcome to BookStore.
Please enter your service option
choice service
1 search by topic
2 lookup by bookId
3 order by bookId
4 Report number of requests by service
5 how many orders are good
6 how many orders failed
7 Average performance time per service
8 Quit.
Enter your service choice
3
Enter the book id you want to ORDER. You may want to search before if you
do not know the book id
IBN-22161773
Book Ordered Failed. Please check Items in stock before ordering
Enter your service choice
```