

University of Dhaka



Department of Computer Science and Engineering

CSE-3101, Computer Networking Lab

3rd Year, 1st Semester

Session: 2018-19



Assignment No. 03

Title of the Assignment: Online Purchase System.

Lab Group: A

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Date: 26th April, 2019

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Goal : In this assignment, our task is to design and implement a simple Online Purchase System, which will consist of an online music CD store, and a banking system. We have to design a simple web server for this store and also another independent program that implements the banking system for verifying the user credit card information before allowing the purchase to be approved.

Theory : The whole system is based on two major connection. They are:

- > TCP connection between client browser and store server
- > TCP connection between store server and bank server

Whenever a user enter the url of the online music CD store on his/her browser (Example : http://STORE_HOST_IP:STORE_PORT/index.html), a tcp connection between the client browser and store server will be established and browser will send a request using the GET Method for the CD store's webpage to the store server. Then server will send the appropriate HTML message to the browser which will be shown as a web page to the user.

Again, when user will fill the provided form in the CD store's webpage to purchase a music CD, browser will send the user's provided information to the store server using the POST method through the TCP connection between them. Then another TCP connection will be established between store server and bank server where store program will act as a client and bank program will act as a server. Store program will send the user and product information to the bank server to verify the transaction. Then bank server will verify the transaction using the database and will send an appropriate response message to the store program and using the response message store program will send a HTML message to the browser to inform the user about the status of the transaction.

Platform: JAVA for backend and HTML,CSS for front-end.

HTML message format: Two types of message are exchanged between the store server and client browser. They are:

| | |
|---|---|
| Request Message Format(GET Method) | GET /index.html HTTP/1.1 Host: localhost:3434 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:66.0) Gecko/20100101 Firefox/66.0 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*; q=0.8 Accept-Language: en-US,en;q=0.5 |
|---|---|

| | |
|---|--|
| | Accept-Encoding: gzip, deflate Connection: keep-alive Upgrade-Insecure-Requests: 1 |
| Request Message Format (POST Method) | POST /index HTTP/1.1 Host: localhost: 3434 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:66.0) Gecko/20100101 Firefox/66.0 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*; q =0.8 Accept-Language: en-US,en;q=0.5 Accept-Encoding: gzip, deflate Referrer: http://localhost:3434/ Content-Type: application/x-www-form-urlencoded Found content-length = 91 Content-Length: 91 Connection: keep-alive Upgrade-Insecure-Requests: 1 itemNumber=5&quantity=1&firstName=Jim&familyName=Morrison&postCode=2052&creditCard=12345678 |
| Response Message Format | HTTP/1.1 200 OK Connection : close Date: Fri Apr 26 17:40:57 BDT 2019 Server: Custom Java HTTP Server Content-Length: 7197 Content-Type: text/html Data..... |

Description: The whole system contains the following components:

1. **Bank.java:** This program initiates a server on the given bank port using ServerSocket class and waits for the request from store program. A TCP connection will be established between bank server and store program when bank receives a request containing user and product information from store program.

Bank server reads the request and data using `BufferedReader` class and verifies the user's information using the `database.txt` file. Bank server uses the `FileReader` class to read the data from the database file and checks whether the provided user's info matches with any entries in the database. If not then it sends a message containing the string "NO_USER". If matches then it checks whether the user has enough available credit to purchase the product. If not then it send the message "INSUFFICIENT_CREDIT". If it has enough credit then bank server updates the database and sends the message "TRANSACTION_APPROVED". After sending the transaction status, the TCP connection between bank and store will be closed.

2. **Store.java:** This program initiates a server on the given port using the `Serversocket` class and waits for the client browser's request. When browser requests a web page form the store server, a TCP connection connection established between store program and browser.

Get Method: Browser requests the web page using the GET method. Store program reads the GET request using the `BufferedReader` class. Then using `PrintWriter` class and `BufferedOutputStream` class store program sends a HTML message associated with `index.html` file according to above response message format.

Post Method: Browser sends a POST request to the Store program containing user and product information when user submit the form in the web page. Store program reads the POST request using the `BufferedReader` class and then using the `PrintWriter` class it will send a request to the Bank server containing the received data from the browser and a TCP connection will be established. Upon receiving the transaction status from Bank, Store server sends a HTML message containing different html files depending on the transaction status from the Bank.

- If transaction status = "NO_USER" then it sends `no_user.html` file
- If transaction status = "INSUFFICIENT_CREDIT" then it sends `insufficient_credit.html` file
- If transaction status = "TRANSACTION_APPROVED" then it sends `transaction_approved.html` file

Store server sends the HTML message to the browser using the `PrintWriter` class and `BufferedOutputStream` class. After sending the HTML message, the tcp connection between the store server and browser will be closed.

3. Index.html:

mystore

localhost:3434

Welcome to our shop
Select your necessary items

Item no: 01
ASkyFullOfStar
Coldplay
Price : 120 taka

Item no: 02
The Scientist
Coldplay
Price : 120 taka

Item no: 03
Imagine Dragons
Imagine Dragons
Price : 1100 taka

Type here to search

8:05 PM
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mystore

localhost:3434

80%

Here is the purchase form

Postcode and credit card information in the specified fields to purchase***

Enter desired item number
desired item number eg. 01

Enter item quantity
item quantity eg. 2

Enter first name
First name eg. Rahat

Enter last name
Last name eg. Rizvi

Enter postcode
postcode eg. 1217

Enter credit card number
credit card number eg. 1112223334

submit

Type here to search

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