

School Of Computer Science

Gujarat University



Certificate

Roll No: **30**

Seat No: _____

This is to certify that Mr. /Ms. **Rathod Ajinkya** student of MCA Semester - IV, has duly completed his / her term work for the semester ending in May 2021, in the subject of **Distributed Application Development** towards partial fulfillment of his / her Degree of Masters in Computer Applications.

May 25, 2021

Date of Submission:

Internal Faculty

Head of Department

Department Of Computer Science Rollwala Computer Centre Gujarat University

MCA – IV

Subject: - Object Oriented Analysis & Design (OOAD)

Name: - Ajinkya Rathod

Roll No.: - 30

Exam Seat No.: - _____

**DEPARTMENT OF COMPUTER SCIENCE
ROLLWALA COMPUTER CENTRE
GUJARAT UNIVERSITY
M.C.A. – IV**

ROLL NO : 30

N A M E : Ajinkya Rathod

S U B J E C T : Distributed Application Development (DAD)

Date _____

Page _____

Name: Ajinkya Rathod.

DAD



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Explain JDBC Architecture

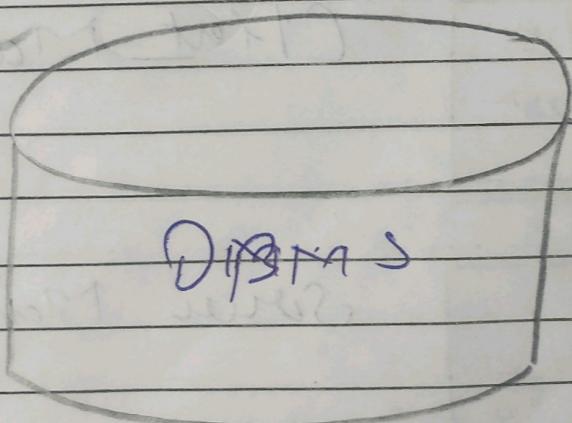
Ans. The JDBC API support both two tier and three tier processing models for data base access.

→ 2 Tier Architecture

Java application
JDBC

Client
Machine

DMS - protocol



Database server



In a tier model, Java application talks directly to data source.

- > This requires a JDBC driver that can communicate with particular data source being accessed.
- > A user's commands are delivered to the database or other data source and the results of those statements are sent back to user.

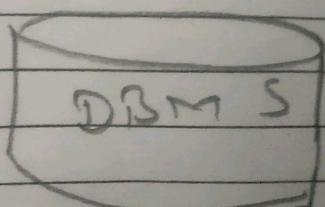
Three tier Application

Java applets
HTML Browser

Client Machine

Application
ODBC

Server Machine



DBMS Prop.
Protocol
Database Source



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- > In this, commands are sent to "middle tier" of services, which then sends the commands to data source.
- > The data source processes the commands and sends the result back to the middle tier then send them to server.

Q2

JDBC Drive Types

* Type-1 (JDBC-ODBC Drive)

→ This does not directly interact with database. This relies on ODBC driver to communicate with database.

→ It depends on ODBC driver.

→ The implementation of this driver makes use of native methods, in order to make standard ODBC calls.

* Type-2 driver

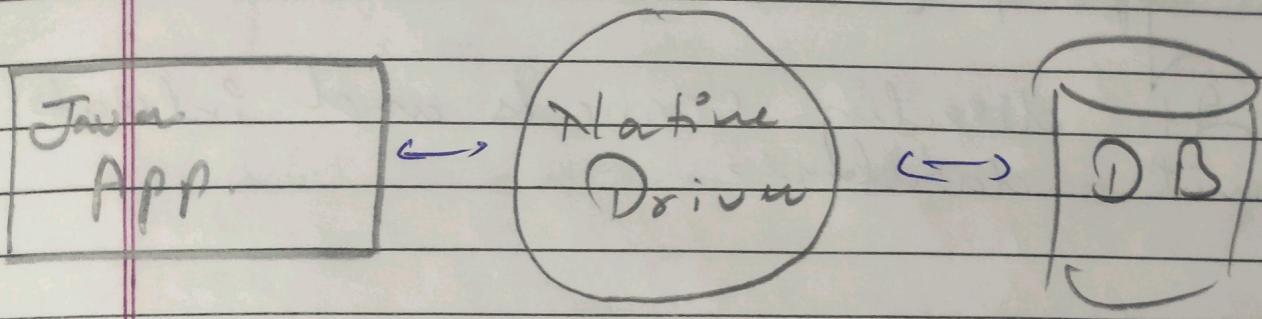
→ It is partially written in Java and partially in native code.

→ It is not dependent on any other driver or application like ODBC.



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* Type-3 (Net Driver)

- These drive interacts directly with database via some network based middleware.
- The implementation of this type of JDBC driver with firewalls based architecture doesn't make use of native code.



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- * Type-4 (Pure Java Driver)
 - It directly connects and interacts with database.
 - Not dependent on any driver.



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Q. Steps of registering Driver class.

1. Load driver class into Java program

Ex: Class.forName("com.mysql.jdbc.Driver")

- 2. You can set driver properties

java - jdbc - driver = com.mysql.jdbc.Driver
password - null

- or you also can set system properties with call such as.

System.setProperties ("jdbc.driver", "-com.mysql.jdbc.Driver"),

Teacher's Signature.....

Q. Parse the following

Execute Update()

- This method is used to execution of DML statement.

INSERT, UPDATE, DELETE?

- This method return int value, count of affected rows.

Q.

Q. Execute Query

This method is used to retrieve data from database using SELECT query.

- This method returns the Result set Object that returns the data according to the query



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This method is used to execute
only select queries.

③ execute

This method used for all types of
SQL statement

- Returns Boolean value of TRUE or FALSE.
- If true, returns ResultSet obj else int value



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Q11

SQL Exceptions & types

① SQL Warning

- An exception that provides information on database user warnings.
- Warnings may be retrieved from connection objects.

public SQLWarning (String reason, String SQLState)

② Batch Update Exception

The subclass of SQLException thrown when an error occurs during a batch update.

In addition to info provided by SQLException, a BatchUpdateException provides all update counts for all commands in the update, executed successfully during batch update.



(3)

Row set warning

An instance of SQL Exception not
processes information about datasecurity.
SQL on round objects?

(4)

SQL Exception

Indicates an error with
misoperation or de-misaligned
of SQL types such as
BLOB, CLOB, STRUCT or
Any in addition to SQL
types such as DATA and
JAVA OBJECT

(5)

SQL Client Into Exception

The success of SQL operation is
true one or not detect it.
Properties.

This provides a list of detailed
info properties that was wrong not.

XML

Q1

DTD.

- To specify document structure, you can supply a DTD or XML schema definition.
- A DTD or schema contains rules that explain what document structure will be allowed.
- DTD might contain a rule:
 - !ELEMENT (name, size)
- XML version="1.0">
- !DOCTYPE config [
 - !Element config
 - more rules
 -]

(config)
config>

Q. DTD and XML

Ans.

1. DTD are declaration that define a document structure schema.

XSD defines schema for XML doc.

2. No Namespaces

Namespaces are not supported

3. No datatype

→ Support datatypes

4. Not extensible

→ Extensible

Q.

DOM vs SAX

- DOM parse is tree based parse. SAX is event based
- DOM loads whole XML docut in memory. SAX locas a small part of XML at a time.
- Faster than XML col. Not faster than DOM more memory.
- Good for large file Best for small size.



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STAX

Q.

- STAX is Stream Event oriented XML parser.
- The model uses `push` is your handle class that calls `onParse`, not the other way around.
- Thus your handle class controls when `push` is to move on to next event in input.
- In other words your handle "pulls" the XML events out of parser.



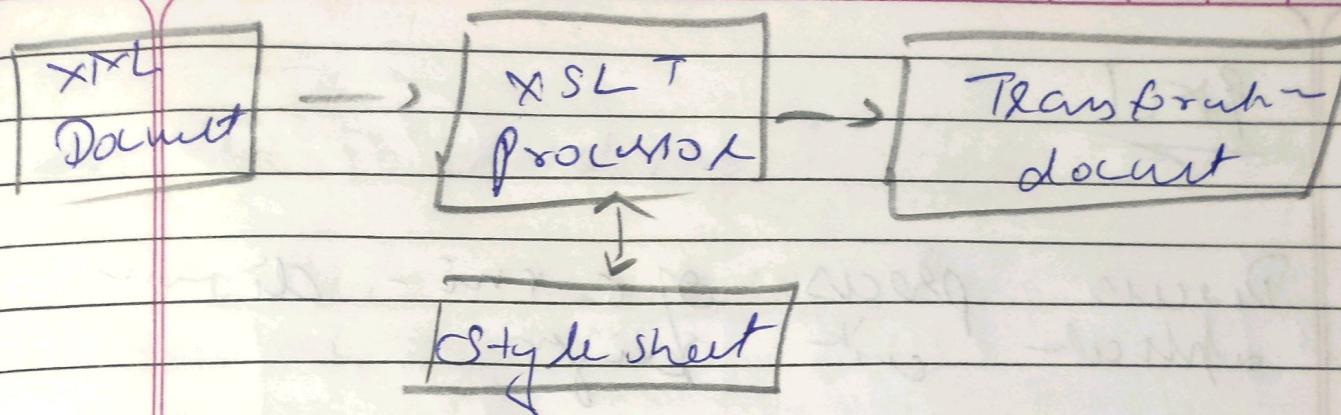
(3) XSLT or XSL

- XSLT is Extensible Stylesheet Language Transformations. (XSLT) API.
- It is not very trivial as XSLT tree is an output structure. The easiest approach is to use XSLT API.
- You need to provide an XSLT stylesheet that defines the conversion from XML of inputs to some other formats.
- The XSLT processor may convert XML documents into segments and pieces. The desired output.



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(4) DTD

Refer Q1.

(5) Schem

The specify the document structure you can specify XML schema definition

- A schema contains rules that express how a document structure be formed by specifying the legal child with all attributes for each elements

Q.

~~Q1~~

Discuss pros & cons of multi-threading
application with diagram

→ multi application are often
comes to be in one program

→ + typical user app can
refer to different objects which
refers to more than one object
accessible and waits for dist to
involve methods on those remote objects

→ RMI provides me notions by user
the server and client communication
and pass data form such as
application → sends requests
to as a distributed object application..



⇒ Distributed Object App. Needs

* Locate Remote Object

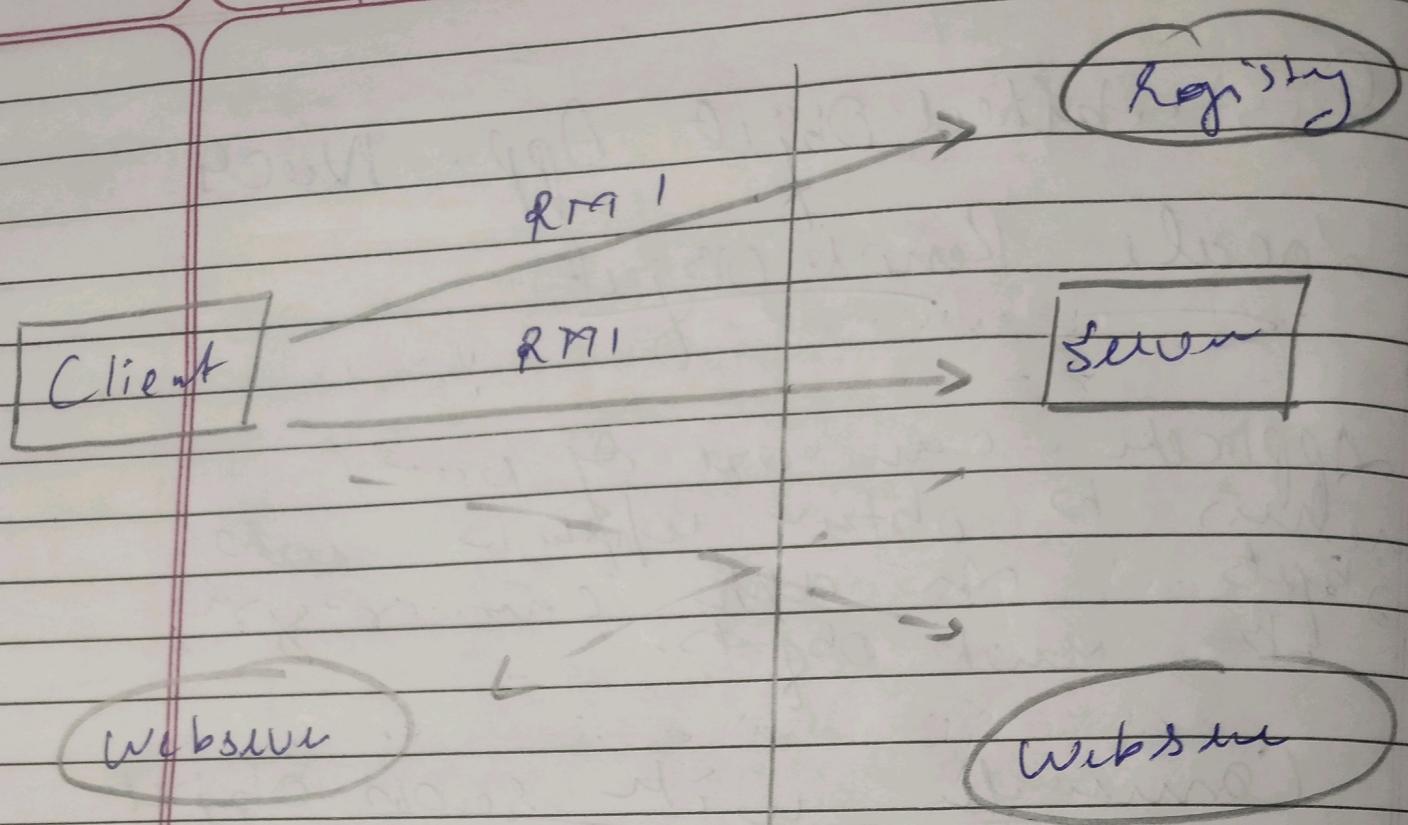
Applets - can use `Object`
refers to obtain references to
objects. An applet can register
to find objects.

* Communicate with remote object

Details of comm - between local
objects are handled by RMI.

In the program. we standardize
method invocation.

- * Load class bytecode for
objects that are passed as
parameters or return value.



The illustration shows an RMI distributed application that registers with a registry to obtain references to a remote object.



O. Stub and skeleton

= stub for a remote object calls on
the local interface as proxy to
make object.

= Interface, a remote object interface
has same set of methods in behalf
of a remote object interface.

- whom stub's is invoked
- marshaled parameters
- waits for result
- returns value to caller func.
- needs serialization.

Skeleton

- responsible for dispatching the call to actual remote object implementation
- unmarshals incoming function
- invokes on remote obj.
- marshals result to caller



Q?

```
import java.rmi.*;  
import javax.rmi.server.*;
```

class AdderRemote extends UnicastRemoteObject
implements Adder

Obj. ref

Adder add() throws RemoteException;
return x+y;

y

public int add(int x, int y)
&
return x+y;

)

Step 4

Start the RMI Registry

5 - Create and execute the server application program

Import `java.rmi.*`~~import `java.rmi.server.*;`~~

public class MyServer {

public void start() {

System.out.println("Server started");

 Add stub = new AddImpl();
 MyRemoteObject rmireg = new MyRemoteObject("rmiregistry", 10000);
 rmireg.rebind("add", stub);

}

}



6 = Create and execute client app. Program -

Internationalization

Collation

- Application that sort through + test perform ~~per~~ frequent string comparisons.
- If your application audience is limited to people who speak English; you can probably perform string comparison using the String.compareTo method

+ Normalization

It is the process by which you can perform certain transformations of text to make it recognizable for a way in which it may not have been before.

⇒ The Unicode standard defines

↳ forms

→ D
→ KD
→ C
→ I_CC

} (for string)

Ch
≡

Message Formatting

The Java library has message Format class that formats text with variable parts.



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- Message Format takes a set of objects, formats them ~~part~~ and then inserts the formatted string into pattern at appropriate places.

```
/*
=====
=====
*
* Roll No: 30
*
* File:      1-Login.html
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */
```

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Login</title>
  </head>
  <body>
    <form action="Login" method="post">
      <table>
        <tr>
          <td>Name:</td>
          <td><input type="text" name="username" /></td>
        </tr>
        <tr>
          <td>Password:</td>
          <td><input type="password" name="password" /></td>
        </tr>
```

```
</table>
<input type="submit" value="Login" />
</form>
</body>
</html>
/*
=====
=====
*
* Roll No: 30
*
* File:      1-Login.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
=====
*/
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class Login extends HttpServlet {
    public void doPost(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        boolean isValidUser;
        PrintWriter pw = response.getWriter();
        response.setContentType("text/html");
    }
}
```

```
        String username =
request.getParameter("username");
        String password =
request.getParameter("password");
        UserValidator userValidator = new
UserValidator();
        isValidUser =
userValidator.validateUser(username, password,
pw);
        if (!isValidUser)
            pw.println("Login Failed");
        else
            pw.println("Login Success");

        pw.close();
    }
} /*
```

```
=====
=====
*
* Roll No: 30
*
* File:      1-UserValidator.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
```

```
=====
===== */
import java.sql.*;
import java.io.PrintWriter;
```

```
public class UserValidator {  
    static final String JDBC_DRIVER =  
"com.mysql.cj.jdbc.Driver";  
    static final String DB_URL =  
"jdbc:mysql://localhost/emp";  
    static final String USER = "root";  
    static final String PASS = "";  
  
    // public static void main(String[] args) {  
    // boolean state = ValidateUser("ajinkya",  
"ajinkya");  
    // System.out.println(state);  
    // }  
  
    public static boolean ValidateUser(String  
username, String password, PrintWriter pw) {  
  
        String sql = "select count(*) as count  
from employees where name=\''" + username + "' AND  
password=\'"  
                + password + "\'";  
        int count = 0;  
        try (Connection conn =  
DriverManager.getConnection(DB_URL, USER, PASS);  
                Statement stmt =  
conn.createStatement()) {  
            Class.forName(JDBC_DRIVER);  
            ResultSet rs = stmt.executeQuery(sql);  
            rs.next();  
            count = rs.getInt("count");  
            rs.close();  
        } catch (Exception e) {
```

```
        pw.println(e.getMessage());
    }

    System.out.println(count);
    return count > 0;
}

/*
=====
=====
*
* Roll No: 30
*
* File:      1-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```



```
<?xml version="1.0" encoding="ISO-8859-1"?>
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"

xsi:schemaLocation="http://java.sun.com/xml/ns/jav
aee

http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
version="3.0"
metadata-complete="true">
```

```
<display-name>LoginServlet</display-name>

<servlet>
    <servlet-name>Login</servlet-name>
    <servlet-class>Login</servlet-class>
</servlet>

<servlet-mapping>
    <servlet-name>Login</servlet-name>
    <url-pattern>/Login</url-pattern>
</servlet-mapping>

<welcome-file-list>
    <welcome-file>Login.html</welcome-file>
</welcome-file-list>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      2-HitCount.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */
import java.io.IOException;
import java.io.PrintWriter;
```

```
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class HitCount extends HttpServlet {
    private int hitCount = 0;

    public void init() {
        hitCount = 0;
    }

    public void doGet(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        response.setContentType("text/html");
        hitCount++;
        PrintWriter pw = response.getWriter();
        String docType = "<!doctype html
public "-//w3c//dtd html 4.0 " +
"transitional//en">\n";
        pw.println(docType + "<html>\n" +
"<head><title>HitCount</title></head>\n" + "<body
bgcolor = "#f0f0f0">\n"
+ "<p>" + hitCount + "</p>" +
"</body> </html>");
    }
}

=====
=====
/*
 * Roll No: 30
```

```
*  
* File:      2-web.xml  
* Copyright: by Ajinkya Rathod(ajinzrathod)  
*  
*  
===== */  
  
<?xml version="1.0" encoding="ISO-8859-1"?>  
<web-app xmlns="http://java.sun.com/xml/ns/javaee"  
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"  
  
         xsi:schemaLocation="http://java.sun.com/xml/ns/jav  
aee  
         http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"  
         version="3.0"  
         metadata-complete="true">  
  
    <display-name>HitCountServlet</display-name>  
  
    <servlet>  
        <servlet-name>HitCount</servlet-name>  
        <servlet-class>HitCount</servlet-class>  
    </servlet>  
  
    <servlet-mapping>  
        <servlet-name>HitCount</servlet-name>  
        <url-pattern>/HitCount</url-pattern>  
    </servlet-mapping>
```

```
</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      3-.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
=====
*/



import java.io.IOException;
import java.io.PrintWriter;
import java.util.Enumeration;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class HeaderInfo extends HttpServlet {

    private static final long serialVersionUID =
1L;

    public void init() throws ServletException {
        System.out.println("\n*****\n");
    }
}
```

```

        System.out.println("HelloWorld servlet
init method has been called.");
        System.out.println("\
n*****\n");
    }

public void doGet(HttpServletRequest request,
HttpServletResponse response) throws
ServletException, IOException {
    response.setContentType("text/html");
    PrintWriter out = response.getWriter();
    String title = "Header Info, Method Type,
Query String";
    String docType = "<!DOCTYPE html
public "-//W3C//DTD HTML 4.0 " +
"Transitional//EN">\n";
    out.println(docType + "<html>\n" +
"<head><title>" + title + "</title></head>\n" +
"<body>\n"
        + "<h1 align=\"center\">" + title
+ "</h1>\n" + "<table width=\"100%\" border=1
align=\"center\">\n"
        + "<tr>\n" +
"<th>Name</th><th>Value(s)</th>\n"
        + "</tr> \n<tr>\n<th
colspan=\"2\">Header Info</th>\n</tr>");
}

Enumeration<String> headerNames =
request.getHeaderNames();

while (headerNames.hasMoreElements()) {

```

```
        String headerName = (String)
headerNames.nextElement();
        out.print("<tr><td>" + headerName +
"</td>\n");
        String headerValue =
request.getHeader(headerName);
        out.println("<td>" + headerValue +
"</td></tr>\n");
    }
    out.println("<tr>\n<th
colspan=\"2\">Method Type</th>\n</tr>" + "<tr>
<td>Method Type</td>\n<td>" +
request.getMethod() + "</td>\n</tr>" + "<tr>\n<th colspan=\"2\">Query
String</th>\n</tr>" +
"<tr>\n<td>Query String</td>\n<td>" + request.getQueryString()
+
"</td>\n</tr>\n</table>\n</body>\n</html>");
}
/*
=====
=====
*
* Roll No: 30
*
* File:      3-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
```

```
*  
===== * /  
  
<?xml version="1.0" encoding="ISO-8859-1"?>  
<web-app xmlns="http://java.sun.com/xml/ns/javaee"  
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"  
  
    xsi:schemaLocation="http://java.sun.com/xml/ns/javae  
    http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"  
    version="3.0"  
    metadata-complete="true">  
  
    <display-name>HeaderInfoServlet</display-name>  
  
    <servlet>  
        <servlet-name>HeaderInfo</servlet-name>  
        <servlet-class>HeaderInfo</servlet-class>  
    </servlet>  
  
    <servlet-mapping>  
        <servlet-name>HeaderInfo</servlet-name>  
        <url-pattern>/HeaderInfo</url-pattern>  
    </servlet-mapping>  
  
</web-app>  
/*  
=====
```

```
*  
* Roll No: 30  
*  
* File:      4-Arithmetic.html  
* Copyright: by Ajinkya Rathod(ajinzrathod)  
*  
*
```

```
===== * /
```

```
<!DOCTYPE html>  
<html lang="en">  
  <head>  
    <meta charset="UTF-8" />  
    <title>Arithmetic Operation</title>  
  </head>  
  <body>  
    <form action="Arithmetic" method="post">  
      <table>  
        <tr>  
          <td>Number 1:</td>  
          <td><input type="number" name="num1" /></td>  
        </tr>  
        <tr>  
          <td>Number 2:</td>  
          <td><input type="number" name="num2" /></td>  
        </tr>  
      </table>  
      <input type="submit" value="Submit" />  
    </form>
```

```
</body>
</html>
/*
=====
=====
*
* Roll No: 30
*
* File:      4-Arithmetic.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*/
===== */
```

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class Arithmetic extends HttpServlet {
    public void doPost(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        PrintWriter pw = response.getWriter();
        response.setContentType("text/html");
        int num1 =
Integer.parseInt(request.getParameter("num1"));
        int num2 =
Integer.parseInt(request.getParameter("num2"));
```

```

        pw.println("<html><head><title>Arithmetic
Operations</title></head><body>"
                + " <table border=\"1\"> <tr> <th>
Operation </th><th> Output </th>""
                + "</tr> <tr> <td> Addition </td>
<td>" + (num1 + num2) + "</td> </tr>""
                + "</tr> <tr> <td> Subtraction
</td> <td>" + (num1 - num2) + "</td> </tr>""
                + "</tr> <tr> <td> Multiplication
</td> <td>" + (num1 * num2) + "</td> </tr>");"
        try {
            pw.println("</tr> <tr> <td> Division
</td> <td>" + (num1 / num2) + "</td> </tr>");"
        } catch (ArithmeticException e) {
            pw.println("</tr> <tr> <td> Division
Error </td> <td> Division with <b>zero</b> not
possible. </td> </tr>");"
        }
        pw.println(" </table> </body> </html>");

        pw.close();
    }
}

/*
=====
=====
*
* Roll No: 30
*
* File:      4-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)

```

```
*  
*  
===== * /  
  
<?xml version="1.0" encoding="ISO-8859-1"?>  
<web-app xmlns="http://java.sun.com/xml/ns/javaee"  
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"  
  
    xsi:schemaLocation="http://java.sun.com/xml/ns/javaee  
                        http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"  
    version="3.0"  
    metadata-complete="true">  
  
        <display-name>ArithmetiServlet</display-name>  
  
        <servlet>  
            <servlet-name>Arithmeti</servlet-name>  
            <servlet-class>Arithmeti</servlet-class>  
        </servlet>  
  
        <servlet-mapping>  
            <servlet-name>Arithmeti</servlet-name>  
            <url-pattern>/Arithmeti</url-pattern>  
        </servlet-mapping>  
  
        <welcome-file-list>  
            <welcome-file>Arithmeti.html</welcome-  
file>
```

```
</welcome-file-list>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      5-StudentDataSave.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */
import java.sql.*;
import java.io.PrintWriter;

public class StudentDataSave {
    static final String JDBC_DRIVER =
"com.mysql.cj.jdbc.Driver";
    static final String DB_URL =
"jdbc:mysql://localhost/college";
    static final String USER = "root";
    static final String PASS = "";

    public static boolean SaveStudent(String name,
String currentClass, String gender, long number,
PrintWriter pw) {
        int result = 0;
```

```
        String sql = "insert into
students(name,class,gender,number) values(\"" +
name + "\",\"" + currentClass
        + "\",\"" + gender + "\","
number + ")";
try (Connection conn =
DriverManager.getConnection(DB_URL, USER, PASS);
Statement stmt =
conn.createStatement();) {
    Class.forName(JDBC_DRIVER);
    result = stmt.executeUpdate(sql);
} catch (Exception e) {
    pw.println(e.getMessage());
}
return result > 0;
}
}

/*
=====
=====
*
* Roll No: 30
*
* File:      5-Student.html
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */
<!DOCTYPE html>
<html lang="en">
```

```
<head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible"
content="IE=edge" />
    <meta name="viewport" content="width=device-
width, initial-scale=1.0" />
    <title>Student</title>
</head>
<body>
    <form action="Student" method="post">
        <input type="text" name="name"
placeholder="Enter Student Name" />
        <select name="class" id="class">
            <option value="MCA1">MCA 1</option>
            <option value="MCA2">MCA 2</option>
            <option value="MCA3">MCA 3</option>
            <option value="MCA4">MCA 4</option>
            <option value="MCA5">MCA 5</option>
            <option value="MCA6">MCA 6</option>
        </select>
        <select name="gender" id="gender">
            <option value="Male">Male</option>
            <option value="Female">Female</option>
        </select>
        <input type="number" name="number"
placeholder="Enter Your Number" />
        <input type="submit" value="submit" />
    </form>
</body>
</html>
```

```
/*
=====
=====
*
* Roll No: 30
*
* File:      5-Student.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class Student extends HttpServlet {
    public void doPost(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        PrintWriter pw = response.getWriter();
        response.setContentType("text/html");
        long number = 0;
        ArrayList arrayList = new ArrayList();

        String name =
request.getParameter("name");
```

```
    if (name == null || name.equals(""))
        arrayList.add("Invalid Student
Name.");

    String currentClass =
request.getParameter("class");
    if (currentClass == null ||
currentClass.equals(""))
        arrayList.add("Invalid Student
Class.");

    String gender =
request.getParameter("gender");
    if (gender == null || gender.equals(""))
        arrayList.add("Invalid Student
Gender.");

try {
    number =
Long.parseLong(request.getParameter("number"));
} catch (NumberFormatException
NumberFormatException) {
    arrayList.add("Invalid Mobile
Number.");
}

if (arrayList.size() > 0) {
    pw.println(arrayList);
} else {
    if (StudentDataSave.SaveStudent(name,
currentClass, gender, number, pw))
```

```
        pw.println("Student Data  
Inserted.....");  
    }  
  
    pw.close();  
}  
}  
/*  
=====  
=====  
*  
* Roll No: 30  
*  
* File:      5-web.xml  
* Copyright: by Ajinkya Rathod(ajinzrathod)  
*  
*  
===== * /  
  
<?xml version="1.0" encoding="ISO-8859-1"?>  
<web-app xmlns="http://java.sun.com/xml/ns/javaee"  
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"  
  
         xsi:schemaLocation="http://java.sun.com/xml/ns/javaee  
                           http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"  
         version="3.0"  
         metadata-complete="true">
```

```
<display-name>StudentServlet</display-name>

<servlet>
    <servlet-name>Student</servlet-name>
    <servlet-class>Student</servlet-class>
</servlet>

<servlet-mapping>
    <servlet-name>Student</servlet-name>
    <url-pattern>/Student</url-pattern>
</servlet-mapping>

<welcome-file-list>
    <welcome-file>Student.html</welcome-file>
</welcome-file-list>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      6-Cart.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */
import java.sql.ResultSet;
import java.io.IOException;
```

```
import java.io.PrintWriter;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;
import java.util.List;

public class Cart extends HttpServlet {
    public void doGet(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        PrintWriter pw = response.getWriter();
        pw.println(
                "<!Doctype HTML><html> <head>
<title> Cart </title> <style> table{ border-
spacing:0px; } td{ text-align:center; } "
                + "</style> </head>
<body><form action=\"DeleteFromDatabase\""
method="get"> <table border=1>"
                + " <tr> <th> Name </th>
<th> Company </th> <th> Price </th> <th> Quantity
</th> <th> Action </th></tr>");
        String sql = "select a.* , b.qty from mobile
a, cart b where a.id = b.mobileid";
        try {
            List<Mobile> cartMobile =
DataRetrive.RetrieveDataFromDatabase(sql, pw);
            cartMobile.stream()
                    .forEach(m -> pw.println("<tr>
<td>" + m.model + " </td><td>" + m.company +
"</td><td>" + m.price
```

```

+ "</td><td>" + m.qty
+ "</td><td><input type=\"radio\" name=\"phone\""
value="" + m.id
+ "\"></td></tr>"));
} catch (Exception e) {
pw.println(e.getMessage());
}
pw.println(
" </table> <input type=\"submit\""
value="Remove From Cart"></form> <a
href="Index">Show Mobiles</a> </body> </html>");
pw.close();
}
}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-DataRetrive.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```

import java.io.PrintWriter;
import java.sql.*;
import java.util.ArrayList;
import java.util.List;

```

```
public class DataRetrive {
    static final String JDBC_DRIVER =
"com.mysql.cj.jdbc.Driver";
    static final String DB_URL =
"jdbc:mysql://localhost/store";
    static final String USER = "root";
    static final String PASS = "";

    // public static void main(String[] args)
throws Exception {
    // var data = RetriveDataFromDatabase("select
* from mobile", new
    // PrintWriter(System.out));

    // }

    public static List<Mobile>
RetriveDataFromDatabase(String sql, PrintWriter
pw) {
        int qty;
        ArrayList<Mobile> ar = new ArrayList<>();
        ResultSet rs = null;
        try (Connection conn =
DriverManager.getConnection(DB_URL, USER, PASS);
                Statement stmt =
conn.createStatement();) {
            Class.forName(JDBC_DRIVER);
            rs = stmt.executeQuery(sql);
            while (rs.next()) {
                int id = rs.getInt("id");
                String name =
rs.getString("model");
                Mobile m = new Mobile(id, name);
                ar.add(m);
            }
        } catch (Exception e) {
            e.printStackTrace();
        }
        pw.println(ar);
    }
}
```

```
        String company =
rs.getString("company");
        Double price =
rs.getDouble("price");
        try {
            qty = rs.getInt("qty");
        } catch (Exception e) {
            qty = 0;
        }
        ar.add(new Mobile(id, name,
company, price, qty));
    }
} catch (Exception e) {
    pw.println(e.getMessage());
}
return ar;
}
```

```
}
```

```
/*
=====
=====
```

```
*
```

```
* Roll No: 30
```

```
*
```

```
* File:      6-DeleteFromDatabase.java
```

```
* Copyright: by Ajinkya Rathod(ajinzrathod)
```

```
*
```

```
*
```

```
=====
===== */
```

```
import java.io.IOException;
```

```
import java.sql.*;
import java.io.PrintWriter;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class DeleteFromDatabase extends
HttpServlet {
    static final String JDBC_DRIVER =
"com.mysql.cj.jdbc.Driver";
    static final String DB_URL =
"jdbc:mysql://localhost/store";
    static final String USER = "root";
    static final String PASS = "";

    public void doGet(HttpServletRequest request,
HttpServletResponse response) throws IOException,
ServletException {
        PrintWriter pw = response.getWriter();
        int res = 0;
        String sql;
        int id =
Integer.parseInt(request.getParameter("phone"));
        // request.getParameterValues();
        try (Connection conn =
DriverManager.getConnection(DB_URL, USER, PASS);
Statement stmt =
conn.createStatement();) {
            Class.forName(JDBC_DRIVER);
            sql = "delete from cart where mobileid
= " + id;
```

```
        res = stmt.executeUpdate(sql);
    } catch (Exception e) {
        pw.println(e.getMessage());
    }
    pw.println(
            "<!Doctype HTML><html> <head>
<title> Database Status </title> </head> <body>
<form action=\"Cart\" method=\"get\">
    if (res > 0)
        pw.println("<p>Successfully Deleted
from Cart....</p>");
    else
        pw.println("<p>Failed to
delete....</p>");

        pw.println("<input type=\"submit\""
value="Cart"> </form> </body> </html>");

    pw.close();
}
}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-Index.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
```

```
*  
===== * /  
  
import java.sql.*;  
import java.io.IOException;  
import java.io.PrintWriter;  
import javax.servlet.http.HttpServlet;  
import javax.servlet.http.HttpServletRequest;  
import javax.servlet.http.HttpServletResponse;  
import javax.servlet.ServletException;  
import java.util.List;  
  
public class Index extends HttpServlet {  
  
    public void doGet(HttpServletRequest request,  
HttpServletResponse response) throws IOException,  
ServletException {  
    PrintWriter pw = response.getWriter();  
    response.setContentType("text/html");  
  
    pw.println(  
        "<!Doctype HTML><html> <head>  
<title> Mobiles </title> <style> table{ border-  
spacing:0px; } td{ text-align:center; }"  
            + " </style> </head>  
<body> <form action=\"InsertIntoDatabase\"  
method=\"get\"> <table border=1>"  
            + " <tr> <th> Name </th>  
<th> Company </th> <th> Price </th> <th> Action  
</th></tr>");
```

```
String sql = "select * from mobile";
try {
    List<Mobile> indexResultSet =
DataRetrive.RetrieveDataFromDatabase(sql, pw);
    indexResultSet.stream()
        .forEach(m -> pw.println("<tr>
<td>" + m.model + " </td><td>" + m.company +
"</td><td>" + m.price
                    + "</td><td><input
type=\"radio\" name=\"phone\" value=\"" + m.id +
"\"> </td> </tr>"));
} catch (Exception e) {
    pw.println(e.getMessage());
}
pw.println(
    " </table> <input type=\"submit\""
value="Add To Cart"> </form> <a
href=\"Cart\">Cart</a> </body> </html>");
pw.close();
}
}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-InsertIntoDatabase.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
```

```
*  
===== * /  
  
import java.io.IOException;  
import java.sql.*;  
import java.io.PrintWriter;  
import javax.servlet.http.HttpServlet;  
import javax.servlet.http.HttpServletRequest;  
import javax.servlet.http.HttpServletResponse;  
import javax.servlet.ServletException;  
  
public class InsertIntoDatabase extends  
HttpServlet {  
    static final String JDBC_DRIVER =  
"com.mysql.cj.jdbc.Driver";  
    static final String DB_URL =  
"jdbc:mysql://localhost/store";  
    static final String USER = "root";  
    static final String PASS = "";  
  
    public void doGet(HttpServletRequest request,  
HttpServletRequest response) throws IOException,  
ServletException {  
    PrintWriter pw = response.getWriter();  
    int res = 0;  
    String sql;  
    int id =  
Integer.parseInt(request.getParameter("phone"));  
    // request.getParameterValues();  
    String checkCart = "select count(mobileid)  
from cart where mobileid=" + id;
```

```

        try (Connection conn =
DriverManager.getConnection(DB_URL, USER, PASS);
                Statement stmt =
conn.createStatement();) {
            Class.forName(JDBC_DRIVER);
            ResultSet rs =
stmt.executeQuery(checkCart);
            rs.next();
            int count =
rs.getInt("count(mobileid)");
            rs.close();
            if (count > 0) {
                sql = "update cart set qty=qty+1
where mobileid = (" + id + ")";
                res = stmt.executeUpdate(sql);
            } else {
                sql = "insert into
cart(mobileid,qty) values(" + id + ",1)";
                res = stmt.executeUpdate(sql);
            }
        } catch (Exception e) {
            pw.println(e.getMessage());
        }
pw.println(
        "<!Doctype HTML><html> <head>
<title> Database Status </title> </head> <body>
<form action=\"Cart\" method=\"get\">";
        if (res > 0)
            pw.println("<p>Added to
Cart....</p>");
        else

```

```

        pw.println("<p>Failed to
add....</p>");

        pw.println("<input type=\"submit\""
value="Cart"> </form> </body> </html>");

        pw.close();
    }

}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-Mobile.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```

public class Mobile {
    public final int id;
    public final String model;
    public final String company;
    public final double price;
    public final int qty;

    public Mobile(int id, String model, String
company, double price, int qty) {
        this.id = id;
    }
}
```

```
        this.model = model;
        this.company = company;
        this.price = price;
        this.qty = qty;
    }

}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"

xsi:schemaLocation="http://java.sun.com/xml/ns/jav
aee

http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
version="3.0"
metadata-complete="true">
```

```
<display-name>MobileServlet</display-name>

<servlet>
    <servlet-name>Index</servlet-name>
    <servlet-class>Index</servlet-class>
</servlet>
<servlet>
    <servlet-name>InsertIntoDatabase</servlet-
name>
    <servlet-class>InsertIntoDatabase</servlet-
class>
</servlet>
<servlet>
    <servlet-name>DeleteFromDatabase</servlet-
name>
    <servlet-class>DeleteFromDatabase</servlet-
class>
</servlet>
<servlet>
    <servlet-name>Cart</servlet-name>
    <servlet-class>Cart</servlet-class>
</servlet>

<servlet-mapping>
    <servlet-name>Index</servlet-name>
    <url-pattern>/Index</url-pattern>
</servlet-mapping>
<servlet-mapping>
    <servlet-name>InsertIntoDatabase</servlet-
name>
    <url-pattern>/InsertIntoDatabase</url-
pattern>
```

```
</servlet-mapping>
<servlet-mapping>
    <servlet-name>DeleteFromDatabase</servlet-
name>
    <url-pattern>/DeleteFromDatabase</url-
pattern>
</servlet-mapping>
<servlet-mapping>
    <servlet-name>Cart</servlet-name>
    <url-pattern>/Cart</url-pattern>
</servlet-mapping>

</web-app>
```

PRACTICAL – II

```
/*
=====
=====
*
* Roll No: 30
*
* File:      1-LastVisit.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
import java.util.*;

public class LastVisit extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
throws IOException, ServletException {
    response.setContentType("text/html");
    PrintWriter pw =
response.getWriter();
```

```
        Date date = new Date();

        String dateString =
String.valueOf(date.getTime());

        Cookie cookie = new
Cookie("Ajinkya", dateString);
        cookie.setMaxAge(86400);
        response.addCookie(cookie);

        Cookie cookies[] =
request.getCookies();

        if (cookies != null) {
            for (int i = 0; i <
cookies.length; i++) {
                if
(cookies[i].getName().equals("Ajinkya")) {
                    long lastTime =
Long.parseLong(cookies[i].getValue());
                    pw.println("Your Last
Visit : " + new Date(lastTime));
                    pw.println("<br>Duration
of time since Last Visit : " +
((date.getTime() - lastTime) / 1000)
+ " Seconds");
            }
        }
    }
}
```

```
        }
    }

}

} /*



=====
=====

*
* Roll No: 30
*
* File:      1-last-visit-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*

=====

===== */



<?xml version="1.0" encoding="ISO-8859-1"?>
<web-app
xmlns="http://java.sun.com/xml/ns/javaee"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"

xsi:schemaLocation="http://java.sun.com/xml/
ns/javaee"
```

```
http://java.sun.com/xml/ns/javaee/web-
app_3_0.xsd"
version="3.0"
metadata-complete="true">

<servlet>
    <servlet-name>LastVisit</servlet-
name>
    <servlet-class>LastVisit</servlet-
class>
</servlet>
<servlet-mapping>
    <servlet-name>LastVisit</servlet-
name>
    <url-pattern>/LastVisit</url-
pattern>
</servlet-mapping>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      2-firstPage.jsp
* Copyright: by Ajinkya Rathod(ajinzrathod)
```

```
*  
*  
===== * /  
  
<!DOCTYPE html>  
<html lang="en">  
  <head>  
    <meta charset="UTF-8" />  
    <meta http-equiv="X-UA-Compatible"  
content="IE=edge" />  
    <meta name="viewport"  
content="width=device-width, initial-  
scale=1.0" />  
    <title>First Page</title>  
  </head>  
  <body>  
    <h2>First page</h2>  
    <% Integer  
count=(Integer)session.getAttribute("keeptra  
ck"); if(count==null)  
    { count=0; }  
session.setAttribute("keeptrack", ++count);  
%>  
    <br />  
    Tracking = <%= count %> <% String  
rurl=request.getRequestURI(); String
```

```
surl=(String)session.getAttribute("url");
session.setAttribute("url", rurl+
    " " +surl); %>
</body>
</html>
/*
=====
=====
*
* Roll No: 30
*
* File:      2-MultiplePageTrack.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */
import java.io.*;
import java.util.*;
import javax.servlet.http.*;
import javax.servlet.*;
import java.util.Date;

public class MultiplePageTrack extends
HttpServlet {
```

```
public void doGet(HttpServletRequest req, HttpServletResponse res) throws IOException, ServletException {
    res.setContentType("Text/html");
    PrintWriter pw = res.getWriter();

    pw.println("TrackUser is called.....");
```

```
HttpSession session =
req.getSession();
    Integer count = (Integer)
session.getAttribute("keeptrack");
    if (count == null) {
        count = 0;
    }
    String surl = (String)
session.getAttribute("url");
    if (surl == null) {
        surl = " ";
    }
    pw.println("<br> Pages Visited : " +
surl);
    pw.println("<br> Request Count : " +
count);
}
```

```
 } /*  
=====
```

*

* Roll No: 30

*

* File: 2-multiple-page-web.xml

* Copyright: by Ajinkya Rathod(ajinzrathod)

*

*

```
===== */
```

```
<?xml version="1.0" encoding="ISO-8859-1"?>  
<web-app  
xmlns="http://java.sun.com/xml/ns/javaee"  
  
xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"  
  
xsi:schemaLocation="http://java.sun.com/xml/  
ns/javaee  
  
http://java.sun.com/xml/ns/javaee/web-  
app_3_0.xsd"  
version="3.0"  
metadata-complete="true">
```

```
<servlet>
    <servlet-name>LastVisit</servlet-
name>
    <servlet-class>LastVisit</servlet-
class>
</servlet>
<servlet-mapping>
    <servlet-name>LastVisit</servlet-
name>
    <url-pattern>/LastVisit</url-
pattern>
</servlet-mapping>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      2-secondPage.jsp
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */



<!DOCTYPE html>
```

```
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible"
content="IE=edge" />
    <meta name="viewport"
content="width=device-width, initial-
scale=1.0" />
    <title>Second Page</title>
  </head>
  <body>
    <h2>Second page</h2>
    <% Integer
count=(Integer)session.getAttribute("keeptra
ck"); if(count==null)
{
  count=0;
}
session.setAttribute("keeptrack", ++count);
%>
    <br />
    Tracking = <%= count %> <% String
rurl=request.getRequestURI(); String

surl=(String)session.getAttribute("url");
session.setAttribute("url", rurl+
" " +surl); %>
  </body>
</html>
```

```
/*
=====
=====
*
* Roll No: 30
*
* File:      3-FilterCh.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
=====
*/
```

```
import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;

public class FilterCh extends HttpServlet {
    public void doGet(HttpServletRequest req, HttpServletResponse res) throws
ServletException, IOException {
        PrintWriter pw = res.getWriter();
        res.setContentType("text/html");
        try {
            Thread.sleep(1000);
        } catch (Exception e) {
            pw.println(e);
        }
}
```

```
    }
} /* =====
=====
*
* Roll No: 30
*
* File:      3-ServerFilter.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
import java.io.*;
import java.util.*;
import javax.servlet.http.*;
import javax.servlet.*;
import java.time.LocalTime;

public class ServerFilter implements Filter
{
    ServletContext context;

    public void doFilter(ServletRequest req,
    ServletResponse res, FilterChain chain)
        throws IOException,
    ServletException {
```

```
    HttpServletRequest request =
(HttpServletRequest) req;
    PrintWriter pw = res.getWriter();

    pw.println("<p>Time OF Request : " +
LocalTime.now());

    long startTime =
System.currentTimeMillis();
    chain.doFilter(req, res);

    long endTime =
System.currentTimeMillis();
    pw.println("</p> <p>Time Of Response
: " + LocalTime.now());
    pw.println("</p> <p>Time take to
process the request : " + (endTime -
startTime) + " miliseconds");
    pw.println("</p> <p>URL of Resource
Requested : " + request.getRequestURL());
    pw.println("</p> <p>IP Address Of
Visitor : " + request.getRemoteAddr() +
"</p>");
}

public void init(FilterConfig config) {
    context =
config.getServletContext();
```

```
    }

public void destroy() {
}

} /* -----
=====

*
* Roll No: 30
*
* File:      3-server-filter-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*

===== */

```



```
<?xml version="1.0" encoding="ISO-8859-1"?>
<web-app
  xmlns="http://java.sun.com/xml/ns/javaee"

  xmlns:xsi="http://www.w3.org/2001/XMLSchema-
  instance"

  xsi:schemaLocation="http://java.sun.com/xml/
  ns/javaee"
```

```
http://java.sun.com/xml/ns/javaee/web-
app_3_0.xsd"
version="3.0"
metadata-complete="true">

<servlet>
    <servlet-name>FilterCh</servlet-
name>
    <servlet-class>FilterCh</servlet-
class>
</servlet>
<servlet-mapping>
    <servlet-name>FilterCh</servlet-
name>
    <url-pattern>/FilterCh</url-pattern>
</servlet-mapping>
<filter>
    <filter-name>ServerFilter</filter-
name>
    <filter-class>ServerFilter</filter-
class>
</filter>
<filter-mapping>
    <filter-name>ServerFilter</filter-
name>
    <servlet-name>FilterCh</servlet-
name>
```

```
</filter-mapping>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      4-DestroySession.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */
import java.io.*;
import java.util.Enumeration;
import javax.servlet.*;
import javax.servlet.http.*;

public class DestroySession extends HttpServlet {
    public void doGet(HttpServletRequest req, HttpServletResponse res) throws ServletException, IOException {
```

```
 HttpSession session =
req.getSession(true);
 session.invalidate();

res.setContentType("text/html");

PrintWriter out = res.getWriter();

out.println("<HEAD><TITLE> " +
"Logout" + "</TITLE></HEAD><BODY>");
 out.println("<P>[<A
HREF=\"/SessionLogin\">Login Page</A>]");
 out.println("<h2> Logged Out
Successfully</h2>");
 out.close();
}

}

/*
=====
=====
*
* Roll No: 30
*
* File:      4-Login.html
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
```

```
*-----  
===== * /  
  
<!DOCTYPE html>  
<html lang="en">  
  <head>  
    <meta charset="UTF-8" />  
    <title>Login</title>  
  </head>  
  <body>  
    <form action="SessionLogin"  
method="post">  
      <table>  
        <tr>  
          <td>Name:</td>  
          <td><input type="text"  
name="username" /></td>  
        </tr>  
        <tr>  
          <td>Password:</td>  
          <td><input type="password"  
name="password" /></td>  
        </tr>  
      </table>  
      <input type="submit" value="Login" />  
    </form>  
  </body>
```

```
</html>
/*
=====
=====
*
* Roll No: 30
*
* File:        4-SessionLogin.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */
===== */
```

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpSession;
import
javax.servlet.http.HttpServletRequest;
import
javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;

public class SessionLogin extends
HttpServlet {
```

```
public void doPost(HttpServletRequest
request, HttpServletResponse response)
throws IOException, ServletException {
    boolean isValidUser;
    PrintWriter pw =
response.getWriter();
    HttpSession session =
request.getSession();

response.setContentType("text/html");
    String username =
request.getParameter("username");
    String password =
request.getParameter("password");
    UserValidator userValidator = new
UserValidator();
    userValidator.ValidateUser(username,
password, pw, session);
    if (session.getAttribute("name") ==
null) {
        pw.println("Login Failed");
        pw.println("<a
HREF=\"/SessionLogin\">Login Page</a>");
    } else {
        pw.println("<h2>User Name : " +
session.getAttribute("name") + "</h2>");
```

```

        pw.println("<h2>User Address : " +
+ session.getAttribute("address") +
"</h2>");

        pw.println("<h2>Date : " +
session.getAttribute("date") + "</h2>");

        pw.println("<h2>Time : " +
session.getAttribute("time") + "</h2>");

        pw.print("<a
href=\"DestroySession\">Logout</a>");

    }

    pw.close();
}

} /*

=====
=====

*
* Roll No: 30
*
* File:      4-user-validation-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*

=====
===== */
```

```

<?xml version="1.0" encoding="ISO-8859-1"?>
<web-app
xmlns="http://java.sun.com/xml/ns/javaee"
```

```
xm|ns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

```
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee"
```

```
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
```

```
version="3.0"
```

```
metadata-complete="true">
```

```
<display-name>SessionLoginServlet</display-name>
```

```
<servlet>
    <servlet-name>SessionLogin</servlet-name>
    <servlet-class>SessionLogin</servlet-class>
</servlet>
```

```
<servlet>
    <servlet-name>DestroySession</servlet-name>
    <servlet-class>DestroySession</servlet-class>
</servlet>
```

```
<servlet-mapping>
    < servlet-name>SessionLogin</servlet-
name>
    <url-pattern>/SessionLogin</url-
pattern>
</servlet-mapping>

<servlet-mapping>
    < servlet-
name>DestroySession</servlet-name>
    <url-pattern>/DestroySession</url-
pattern>
</servlet-mapping>

<welcome-file-list>
    <welcome-file>Login.html</welcome-
file>
</welcome-file-list>

</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      4-UserValidator.java
```

```
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
===== */



import java.sql.*;
import java.io.PrintWriter;
import javax.servlet.http.HttpSession;

public class UserValidator {
    static final String JDBC_DRIVER =
"com.mysql.cj.jdbc.Driver";
    static final String DB_URL =
"jdbc:mysql://localhost/company";
    static final String USER = "root";
    static final String PASS = "";

    // public static void main(String[]
args) {
        // boolean state =
ValidateUser("Ajinkya", "Ajinkya");
        // System.out.println(state);
        // }

    public static void ValidateUser(String
username, String password, PrintWriter pw,
HttpSession session) {
```

```
String sql = "select * from employees where name=\''" + username + "\' AND password=\''" + password + "\'";
int count = 0;
try (Connection conn =
DriverManager.getConnection(DB_URL, USER,
PASS);
Statement stmt =
conn.createStatement()) {
    Class.forName(JDBC_DRIVER);
    ResultSet rs =
stmt.executeQuery(sql);
    while (rs.next()) {
        String name =
rs.getString("name");
        String address =
rs.getString("address");
        session.setAttribute("name",
name);

session.setAttribute("address", address);
        session.setAttribute("date",
java.time.LocalDate.now());
        session.setAttribute("time",
java.time.LocalTime.now());
    }
    rs.close();
}
```

```
        } catch (Exception e) {
            pw.println(e.getMessage());
        }
    }
/*
=====
=====
*
* Roll No: 30
*
* File:      5-web.xml
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!--
```

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-->

```
<web-app  
xmlns="http://java.sun.com/xml/ns/javaee"
```

```
xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
instance"
```

```
xsi:schemaLocation="http://java.sun.com/xml/  
ns/javaee"
```

```
http://java.sun.com/xml/ns/javaee/web-
app_3_0.xsd"
version="3.0"
metadata-complete="true">
<listener>
    <listener-
class>MyAttributeListener</listener-class>
</listener>
<servlet>
    <servlet-name>ProductsPage</servlet-
name>
    <servlet-
class>ProductsPage</servlet-class>
</servlet>
<servlet>
    <servlet-name>AddToCart</servlet-
name>
    <servlet-class>AddToCart</servlet-
class>
</servlet>
<servlet>
    <servlet-name>ShopCart</servlet-
name>
    <servlet-class>ShopCart</servlet-
class>
</servlet>
<servlet>
```

```
        <servlet-
name>RemoveFromCart</servlet-name>
            <servlet-
class>RemoveFromCart</servlet-class>
        </servlet>

        <servlet-mapping>
            <servlet-
name>RemoveFromCart</servlet-name>
                <url-pattern>/RemoveFromCart</url-
pattern>
            </servlet-mapping>
            <servlet-mapping>
                <servlet-name>ShopCart</servlet-
name>
                    <url-pattern>/ShopCart</url-pattern>
                </servlet-mapping>
                <servlet-mapping>
                    <servlet-name>AddToCart</servlet-
name>
                        <url-pattern>/AddToCart</url-
pattern>
                    </servlet-mapping>
                    <servlet-mapping>
                        <servlet-name>ProductsPage</servlet-
name>
                            <url-pattern>/ProductsPage</url-
pattern>
```

```
    </servlet-mapping>
</web-app>
/*
=====
=====
*
* Roll No: 30
*
* File:      6-AddToCart.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*/
import java.io.*;
import java.util.*;

import javax.servlet.*;
import javax.servlet.http.*;

public class AddToCart extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        PrintWriter pw =
response.getWriter();
```

```
response.setContentType("text/html");

HttpSession session =
request.getSession(false);

if (session == null) {
    pw.println("-- creating new
session in the servlet --");
    session =
request.getSession(true);
    pw.println("-- session created
in the servlet --");
}

String[] selectedProductIds =
request.getParameterValues("addToCart");

Database.addToCart(selectedProductIds, pw);

for (int i = 0; i <
selectedProductIds.length; i++) {
    Object attr =
session.getAttribute(selectedProductIds[i]);
    if (attr != null)

session.setAttribute(selectedProductIds[i],
Integer.parseInt(attr.toString()) + 1);
```

```
    else  
  
        session.setAttribute(selectedProductIds[i],  
        1) ;  
    }  
  
    double total =  
Database.getTotalPrice(session, pw);  
    System.out.println("Total Price: " +  
total);  
  
    pw.println("<a href='ShopCart'>View  
Cart</a>");  
    pw.println("<a  
href='ProductsPage'>View Products</a>");  
  
    pw.close();  
}  
} /*  
=====  
=====  
*  
* Roll No: 30  
*  
* File: 6-Cart.java  
* Copyright: by Ajinkya Rathod(ajinzrathod)  
*
```

```
*-----  
===== */  
  
import java.util.Collections;  
import java.util.List;  
  
class CartItem {  
    final Product product;  
    final int qty;  
  
    CartItem(Product product, int qty) {  
        this.product = product;  
        this.qty = qty;  
    }  
}  
  
public class Cart {  
    private List<CartItem> _items;  
  
    public Cart(List<CartItem> items) {  
        this._items = items;  
    }  
  
    public List<CartItem> items() {  
        return  
        Collections.unmodifiableList(_items);  
    }  
}
```

```
    } /*  
=====  
=====  
*  
* Roll No: 30  
*  
* File:      6-Database.java  
* Copyright: by Ajinkya Rathod(ajinzrathod)  
*  
*  
=====  
===== */
```

```
import java.sql.*;  
import java.util.*;  
import java.io.PrintWriter;  
import javax.servlet.http.HttpSession;  
  
public class Database {  
    static final String DB_URL =  
"jdbc:mysql://localhost:3306/test";  
    static final String JDBC_DRIVER =  
"com.mysql.cj.jdbc.Driver";  
    static final String USER = "root";  
    static final String PASSWORD = "";  
  
    static Product fetchProduct(int id,  
PrintWriter pw) {
```

```
    try (Connection con =
DriverManager.getConnection(DB_URL, USER,
PASSWORD);
        Statement stmt =
con.createStatement()) {
    Class.forName(JDBC_DRIVER);
    ResultSet rs =
stmt.executeQuery("SELECT * from products
WHERE id=" + id);
    if (rs.next())
        return new
Product(rs.getInt("id"),
rs.getString("name"),
rs.getString("description"),
rs.getDouble("price"));
} catch (Exception e) {
    pw.println("Error: " +
e.getMessage());
    return null;
}
return null;
}

static List<Product>
fetchProducts(PrintWriter pw) {
    List<Product> products = null;
```

```
    try (Connection connection =
DriverManager.getConnection(DB_URL, USER,
PASSWORD);
        Statement stmt =
connection.createStatement()) {
    products = new ArrayList<>();
    String sql = "SELECT * FROM
products ORDER BY id";
    Class.forName(JDBC_DRIVER);
    ResultSet rs =
stmt.executeQuery(sql);

    while (rs.next()) {
        products.add(new
Product(rs.getInt("id"),
rs.getString("name"),
rs.getString("description"),

rs.getDouble("price")));
    }
} catch (Exception e) {
    pw.print("Error: " +
e.getMessage());
    return null;
}
return products;
}
```

```
    static void addToCart(String[] ids,
PrintWriter pw) {
        Arrays.stream(ids).forEach(id -> {
            String sql = "INSERT INTO
shopcart VALUES(" + Integer.parseInt(id) +
")";
            try (Connection con =
DriverManager.getConnection(DB_URL, USER,
PASSWORD);
Statement stmt =
con.createStatement()) {
                stmt.executeUpdate(sql);
            } catch (Exception e) {
                pw.print("Error: " +
e.getMessage());
            }
        });
        pw.println("Added to Cart!");
    }

    static void removeFromCart(String[] ids,
PrintWriter pw) {
        Arrays.stream(ids).forEach(id -> {
            String sql = "DELETE FROM
shopcart WHERE productId=" +
Integer.parseInt(id);
        });
    }
}
```

```
        try (Connection con =
DriverManager.getConnection(DB_URL, USER,
PASSWORD);
        Statement stmt =
con.createStatement()) {
        stmt.executeUpdate(sql);
    } catch (Exception e) {
        pw.print("Error: " +
e.getMessage());
    }
}
pw.println("Removed From Cart!");
}

static Cart fetchCart(PrintWriter pw) {
List<CartItem> items = new
ArrayList<>();

try (Connection con =
DriverManager.getConnection(DB_URL, USER,
PASSWORD);
        Statement stmt =
con.createStatement()) {
        Class.forName(JDBC_DRIVER);
        ResultSet rs = stmt
                .executeQuery("SELECT
productId, COUNT(productId) AS count FROM
shopcart GROUP BY productId");
    }
}
```

```
        while (rs.next()) {
            int id =
rs.getInt("productId");
            int qty =
rs.getInt("count");

            items.add(new
CartItem(fetchProduct(id, pw), qty));
        }
    } catch (Exception e) {
    pw.println("Error: " +
e.getMessage());
    return null;
}

return new Cart(items);
}

static double getTotalPrice(HttpServletRequest
session, PrintWriter pw) {
    double total = 0;

    Enumeration<String> attrs =
session.getAttributeNames();

    while (attrs.hasMoreElements()) {
        String attr =
attrs.nextElement();
```

```
        int count =
Integer.parseInt(session.getAttribute(attr).toString());
        total +=
fetchProduct(Integer.parseInt(attr),
pw).price * count;
    }
```

```
    return total;
```

```
}
```

```
} /*
```

```
=====
```

```
=====
```

```
*
```

```
* Roll No: 30
```

```
*
```

```
* File:      6-MyAttributeListener.java
```

```
* Copyright: by Ajinkya Rathod(ajinzrathod)
```

```
*
```

```
*
```

```
=====
```

```
===== */
```

```
import javax.servlet.*;
import javax.servlet.http.*;
```

```
public class MyAttributeListener implements
HttpSessionAttributeListener {
```

```
@Override
public void
attributeAdded(HttpSessionBindingEvent
event) {
    String attributeName =
event.getName();
    Object attributeValue =
event.getValue();
    System.out.println("Attribute added:
" + attributeName + " : " + attributeValue);
}
```

```
@Override
public void
attributeRemoved(HttpSessionBindingEvent
event) {
    String attributeName =
event.getName();
    Object attributeValue =
event.getValue();
    System.out.println("Attribute
removed: " + attributeName + " : " +
attributeValue);
}
```

```
@Override
```

```
public void
attributeReplaced.HttpSessionBindingEvent
event) {
    String attributeName =
event.getName();
    Object attributeValue =
event.getValue();
    System.out.println("Attribute
replaced: " + attributeName + " : " +
attributeValue);
}
/*
=====
=====
*
* Roll No: 30
*
* File:      6-Product.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
=====
*/

```

```
public class Product {
    final int id;
    final String name;
```

```
final String description;
final double price;

public Product(int id, String name,
String description, double price) {
    this.id = id;
    this.name = name;
    this.description = description;
    this.price = price;
}

@Override
public String toString() {
    return name;
}
} /* =====
=====
*
* Roll No: 30
*
* File:      6-ProductsPage.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
import java.util.List;

import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class ProductsPage extends
HttpServlet {
    protected void doGet(HttpServletRequest
request, HttpServletResponse response)
        throws ServletException,
IOException {
    PrintWriter pw =
response.getWriter();

response.setContentType("text/html");

    HttpSession session =
request.getSession(false);
    if (session == null) {
        System.out.println("-- creating
new session in the servlet --");
        session =
request.getSession(true);
        System.out.println("-- session
created in the servlet --");
    }
}
```

```
        List<Product> products =
Database.fetchProducts(pw);

        pw.print("<form method='post' "
action='AddToCart' >");
        pw.print("<table border='1' "
style='border-collapse: collapse;' >");

pw.print("<tr><th></th><th>Name</th><th>Desc
ription</th><th>Price</th></tr>");

products.stream().map(p -> {
    return "<tr>" + "<td><input
type='checkbox' name='addToCart' value=''" +
p.id + "'></td>" + "<td>" + p.name
            + "</td>" + "<td>" +
p.description + "</td>" + "<td>Rs. " +
p.price + "</td>" + "</tr>";
}).forEach(pw::print);

pw.print("</table>");
pw.print("<input type='submit' "
value='Add to Cart' >");
pw.print("</form>");

pw.close();
}
```

```
}

/*
=====
=====
*
* Roll No: 30
*
* File:      6-RemoveFromCart.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
*
===== */

```

```
import javax.servlet.*;
import javax.servlet.http.*;

import java.io.*;
import java.util.*;

public class RemoveFromCart extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        PrintWriter pw =
response.getWriter();
```

```
response.setContentType("text/html");

    String[] selectedProductIds =
request.getParameterValues("removeFromCart")
;

    if (selectedProductIds.length < 1)
        return;

    HttpSession session =
request.getSession(false);

    if (session == null) {
        pw.println("-- creating new
session in the servlet --");
        session =
request.getSession(true);
        pw.println("-- session created
in the servlet --");
    }

Database.removeFromCart(selectedProductIds,
pw);

    for (int i = 0; i <
selectedProductIds.length; i++) {
```

```
        Object attr =
session.getAttribute(selectedProductIds[i]);
        if (attr != null)

session.removeAttribute(selectedProductIds[i]);
}

double total =
Database.getTotalPrice(session, pw);
System.out.println("Total Price: " +
total);

pw.print("<a href='ShopCart'>View
Cart</a>");
pw.print("     &nbsp;&nbsp;&nbsp;<a
href='ProductsPage'>View Products</a>");

}
} /* =====
=====
*
* Roll No: 30
*
* File:      6-ShopCart.java
* Copyright: by Ajinkya Rathod(ajinzrathod)
*
```

```
*----- * /  
  
import java.io.*;  
import java.util.List;  
  
import javax.servlet.*;  
import javax.servlet.http.*;  
  
public class ShoppingCart extends HttpServlet {  
    protected void doGet(HttpServletRequest request, HttpServletResponse response)  
        throws ServletException, IOException {  
        PrintWriter pw =  
response.getWriter();  
  
response.setContentType("text/html");  
  
        Cart cart = Database.fetchCart(pw);  
        pw.print("<form  
action='RemoveFromCart' method='post'>");  
        pw.print("<table border='1'  
style='border-collapse: collapse;'>");  
  
pw.print("<tr><th>Product</th><th>Quantity</th><th></th></tr>");
```

```
cart.items().stream().forEach(item -> {
    pw.print("<tr>");
    pw.print("<td>" + item.product +
"</td>");
    pw.print("<td>" + item.qty +
"</td>");
    pw.print("<td><input
type='checkbox' value=''" + item.product.id +
"' name='removeFromCart'></td>");
    pw.print("</tr>");
});

pw.print("</table>");
pw.print("<br /><input type='submit'
value='Remove From Cart'>");
pw.print("<br/><a
href='ProductsPage'>View Products</a>");
pw.print("</form>");

}
}
```