SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur-603203.

DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR: 2020-2021

ODD SEMESTER

LAB MANUAL

(REGULATION - 2017)

IT8511 – WEB TECHNOLOGY LABORATORY

FIFTH SEMESTER

B.Tech - Information Technology

Prepared By

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. To afford the necessary background in the field of Information Technology to deal with engineering problems to excel as engineering professionals in industries.
2. To improve the qualities like creativity, leadership, teamwork and skill thus contributing towards the growth and development of society.
3. To develop ability among students towards innovation and entrepreneurship that caters to the needs of Industry and society.
4. To inculcate and attitude for life-long learning process through the use of information technology sources.
5. To prepare then to be innovative and ethical leaders, both in their chosen profession and in other activities.

PROGRAMME OUTCOMES (POs)

After going through the four years of study, Information Technology Graduates will exhibit ability to:

PO#	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	Design/development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.
4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and

		modeling to complex engineering activities, with an understanding of the limitations.
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
11	Project management and finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
12	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAM SPECIFIC OUTCOMES (PSOs)

By the completion of Information Technology program the student will have following Program specific outcomes

1. Design secured database applications involving planning, development and maintenance using state of the art methodologies based on ethical values.
2. Design and develop solutions for modern business environments coherent with the advanced technologies and tools.
3. Design, plan and setting up the network that is helpful for contemporary business environments using latest hardware components.
4. Planning and defining test activities by preparing test cases that can predict and correct errors ensuring a socially transformed product catering all technological needs.

OBJECTIVES

- To design interactive web pages using Scripting languages.
- To learn server side programming using servlets and JSP.
- To develop web pages using XML/XSLT.

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML. i) To embed an image map in a web page. ii) To fix the hot spots. iii) Show all the related information when the hot spots are clicked

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML.

4. Installation of Apache Tomcat web server.

5. Write programs in Java using Servlets: To invoke servlets from HTML forms. Session Tracking.

6. Write programs in Java to create three-tier applications using JSP and Databases

    a. For conducting on-line examination.

    b. For displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

7. Programs using XML – Schema – XSLT/XSL.

8. Programs using DOM and SAX parsers.

9. Programs using AJAX.

10. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

TOTAL: 60 PERIODS

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

SOFTWARE

- Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server, WAMP/XAMPP

OUTCOME

- Design simple web pages using markup languages like HTML and XHTML.
- Create dynamic web pages using DHTML and java script that is easy to navigate and use.
- Program server side web pages that have to process request from client side web pages.
- Represent web data using XML and develop web pages using JSP.
- Understand various web services and how these web services interact.

COURSE OUTCOMES

IT8511.1	Design simple web pages using markup languages like HTML and XHTML.
IT8511.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
IT8511.3	Program server side web pages that have to process request from client side web pages.
IT8511.4	Represent web data using XML and develop web pages using JSP.
IT8511.5	Understand various web services and how these web services interact.
IT8511.6	Understand various parsers and how they parse the web pages.

CO-PO MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
IT8511.1	3	1	1	-	3	-	-	-	-	-	-	-
IT8511.2	3	1	1	-	3	-	-	-	-	-	-	-
IT8511.3	-	-	1	-	3	-	-	-	-	-	-	-
IT8511.4	-	-	1	-	3	-	-	-	-	-	-	-
IT8511.5	-	-	1	-	3	-	-	-	-	-	-	-
IT8511.6	-	-	1	-	-	-	-	-	-	-	-	-

CO-PSO MATRIX

CO	PSO 1	PSO 2	PSO 3	PSO 4
IT8511.1	-	3	-	-
IT8511.2	-	3	-	-
IT8511.3	-	3	-	-
IT8511.4	-	3	-	-
IT8511.5	-	3	-	-
IT8511.6	-	3	-	-

EVALUATION PROCEDURE FOR EACH EXPERIMENT

S.No	Description	Mark
1.	Aim & Pre-Lab discussion	20
2.	Observation	20
3.	Conduction and Execution	30
4.	Output & Result	10
5.	Viva	20
Total		100

INTERNAL ASSESSMENT FOR LABORATORY

S.No	Description	Mark
1.	Conduction & Execution of Experiment	50
2.	Record	25
3.	Model Test	25
Total		100

INTRODUCTION TO SOFTWARE TO BE USED

Dream Weaver

On the surface, Dreamweaver is an IDE (Integrated Development Environment). That means it’s a piece of software that combines different tools to make web design and development easier.

What makes it special is that it is somewhere between a CMS (where you control everything about your website through a visual interface) and a pure code editor.

MySQL

MySQL is an open source relational database management system. It runs as a server and allows multiple users to manage and create numerous databases. It is a central component in the LAMP stack of open source web application software that is **used** to create **websites**.

Apache Server

Apache is an open-source and free web server software that **powers around 40% of websites** around the world. The official name is **Apache HTTP Server**, and it’s maintained and developed by the Apache Software Foundation.

It allows website owners to serve content on the web — hence the name “web server.” When someone wants to visit a website, they enter a domain name into the address bar of their browser. Then, the web server delivers the requested files by acting as a virtual delivery man.

File servers, database servers, mail servers, and web servers use different kinds of server software. Each of these applications can access files stored on a physical server and use them for various purposes.

The job of a web server is to serve websites on the internet. To achieve that goal, it acts as a middleman between the server and client machines. It pulls content from the server on each user request and delivers it to the web.

WAMP

WAMP - Stands for "Windows, Apache, MySQL, and PHP." WAMP is a variation of LAMP for Windows systems and is often installed as a software bundle (Apache, MySQL, and PHP). It is often used for web development and internal testing, but may also be used to serve live websites.

XAMPP

XAMPP is an abbreviation for cross-platform, Apache, MySQL, **PHP** and Perl, and it allows you to build WordPress site offline, on a local web server on your computer. This simple and lightweight solution works on Windows, Linux, and Mac – hence the “cross-platform” part.

Ex No: 1

CREATION OF IMAGE MAP TO FIX HTOSPOTS

AIM

To create a web page with image map to fix the hotspots and show its related information.

SOFTARE USED

Dreamweaver or Notepad and browser.

DESCRIPTION

In Web page development, an image map is a graphic image defined so that a user can click on different areas of the image and be linked to different destinations. You make an image map by defining each of the sensitive areas in terms of their x and y coordinates (that is, a certain horizontal distance and a certain vertical distance from the left-hand corner of the image). With each set of coordinates, you specify a Uniform Resource Locator or Web address that will be linked to when the user clicks on that area.

There are three HTML elements used to create image maps:

<img> specifies the location of the image to be included in the map.

<map> is used to create the map of clickable areas.

<area> is used within the map element to define the clickable areas.

CODE

main.html

```
<html>
<head>
<BODY bgcolor="#gop6876cgdt5564ss">
<img src ="indiamap.jpeg" usemap="#indiamap" />
<map name=indiamap>
<area shape="circle" coords="500,1092,15" href="tamilnadu.html" alt="Tamilnadu">
<area shape="rect" coords="376,1076,406,1100" href="karnataka.html" alt="Karnataka">
</map>
</head>
</BODY>
</html>
```

tamilnadu.html

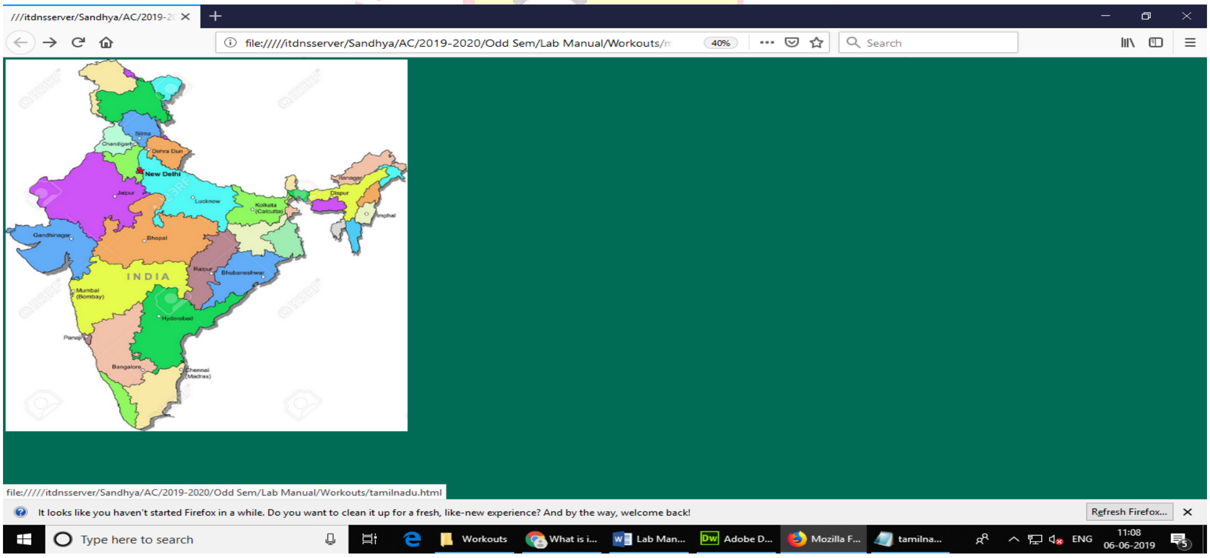
```
<html>
<head><title>Tanil Nadu - India</title></head>
<body bgcolor="palegreen">
<h1><center>Tamil Nadu</center></h1>
<h3>is one of the 29 states of India. Its capital and largest city is Chennai.
Tamil Nadu lies in the southernmost part of the Indian Peninsula and
is bordered by the States of puducherry, Kerala, Karnataka, Andha Pradesh.
</h3>
<h3>
<ul>
<li>Districts<i> - 33</i>
<li>Capital City<i> - Chennai</i>
<li>Largest City<i> - Chennai</i>
<li>Governor<i> - Banwarilal Purohit</i>
<li>Chief Minister<i> - Edappadi K. Palaniswami </i>
<li>Population<i> - 72,147,030</i>
```

```
<li>Tourist spots<i> - Mamallapuran, Ooty, Kodaikanal, Marina,
Mudurai Meenakshi Amman Temple, Thanjavur etc.,</i>
</ul>
<a href="main.html">back</a>
</body>
</html>
```

karnataka.html

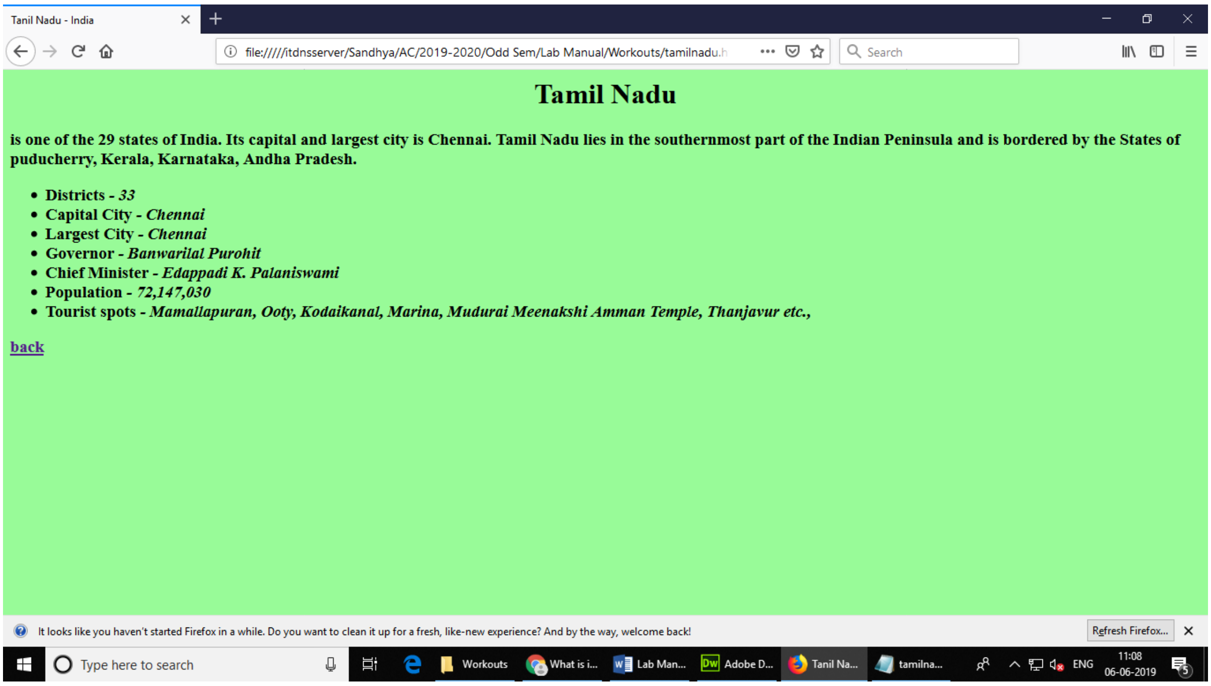
```
<html>
<head><title>Karnataka - India</title></head>
<body bgcolor="wheat">
<h1><center>Karnataka</center></h1>
<h3>
<ul>
<li>Districts<i> - 30</i>
<li>Capital City<i> - Bangalore</i>
<li>Largest City<i> - Bangalore</i>
<li>Governor<i>- Vajubhai Vala</i>
<li>Chief Minister<i> - H. D. Kumaraswamy </i>
<li>Population<i> - 61,130,704</i>
<li>Tourist spots<i> - Gol Gumbaz, Mysore Palace, Keshava Temple etc.,</i>
</ul>
</h3>
<a href="main.html">back</a>
</body>
</html>
```

OUTPUT



file://///itdnsserver/Sandhya/AC/2019-2020/Odd Sem/Lab Manual/Workouts/tamilnadu.html

It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!



Tamil Nadu

is one of the 29 states of India. Its capital and largest city is Chennai. Tamil Nadu lies in the southernmost part of the Indian Peninsula and is bordered by the States of puducherry, Kerala, Karnataka, Andha Pradesh.

- **Districts -** ***33***
- **Capital City -** ***Chennai***
- **Largest City -** ***Chennai***
- **Governor -** ***Banwarilal Purohit***
- **Chief Minister -** ***Edappadi K. Palaniswami***
- **Population -** ***72,147,030***
- **Tourist spots -** ***Mamallapuran, Ooty, Kodaikanal, Marina, Mudurai Meenakshi Amman Temple, Thanjavur etc.,***

back

It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is HTML?
2. What is a tag?
3. What is the use of image map?
4. What are the elements used to create image?
5. List the attributes of <area> element.
6. What is the importance of HTML DOCTYPE?
7. What are the features of HTML?
8. How do you include links in HTML page?
9. What are the different types of lists?
10. List the types of headers available in HTML.

RESULT

Thus the Web Page had been created using image map to fix the hotspots and relevant information had been displayed.

Ex No: 2

CREATION OF A WEB PAGE WITH ALL TYPES OF CASCADING STYLE SHEETS

AIM

To create a webpage with all types of Cascading Style Sheets.

SOFTARE USED

Dreamweaver or Notepad and browser.

DESCRIPTION

Cascading Style Sheet (CSS) is used to set the style in web pages which contain HTML elements. It sets the background color, font-size, font-family, color etc property of elements in a web pages.

There are three types of CSS which are given below:

- Inline CSS
- Internal or Embedded CSS
- External CSS

ALGORITHM

Internal CSS:

STEP 1: Create a HTML program with <style> tag.
STEP 2: Inside the <style> tag, specify the format required for that web page.
STEP 3: Run the program with a web browser.

External CSS:

STEP 4: Open a notepad, type the needed CSS in it and save it with .css extension.
STEP5: Refer this .css file in the HTML using the tag <link>.
STEP 6: Run the program with a web browser.

CODE

style.html

```
<html>
<head>
<title>FLOWERS</title>
<!--Extended Style Sheet -->
<link rel="stylesheet" type="text/css" href="style.css">
<!-- Embed Style Sheet-->
<style type="text/css">
p{
background-color: lightgrey;
text-align: justify;
margin: 2em 7em;
}
</style>
</head>
<body id="body">
<h1>FLOWER</h1>
<p>
<span style="font: 200 x-large fantasy">Flower</span>
sometimes known as a bloom or blossom,
is the reproductive structure found in flowering plants.
```

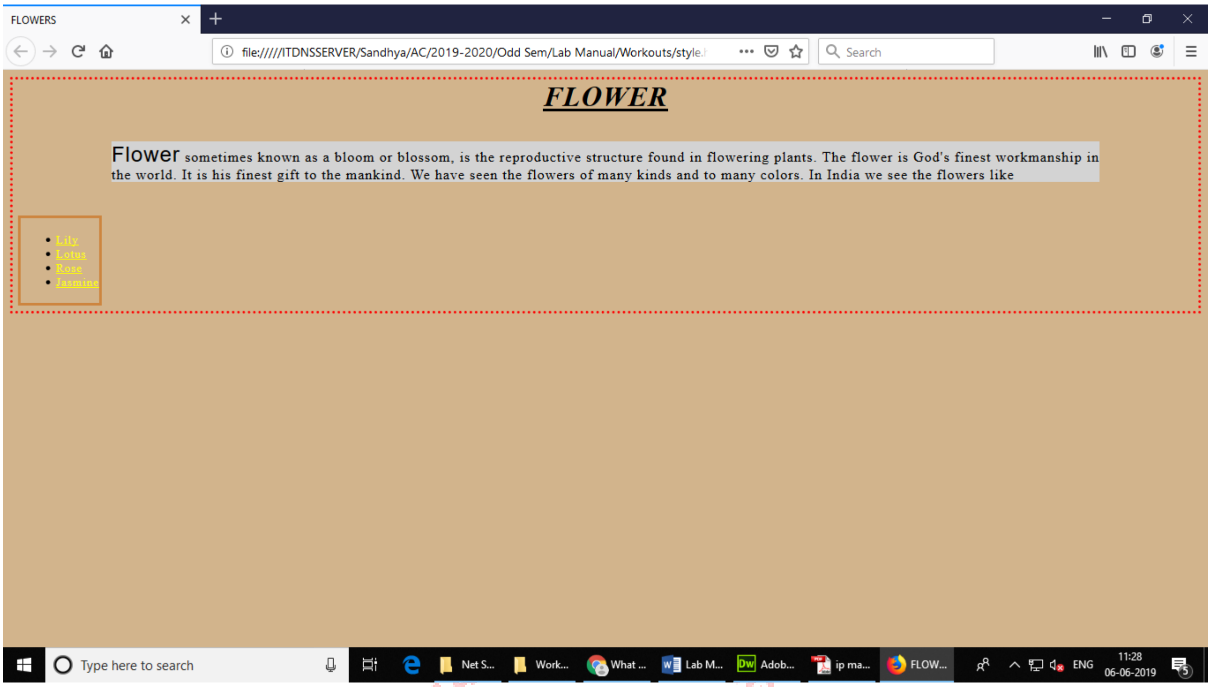
```
The flower is God's finest workmanship in the world.
It is his finest gift to the mankind.
We have seen the flowers of many kinds and to many colors.
In India we see the flowers like
</p>
<!-- Inline Sytle Sheet-->
<table style="background-position: center;text-align: center;padding: 3px;">
<tr>
<td align="left">
<div class="div">
<ul>
<li><a href="">Lily</a></li>
<li><a href="">Lotus</a></li>
<li><a href="">Rose</a></li>
<li><a href="">Jasmine</a></li>
</ul>
</div>
</td>
</tr>
</table>
</body>
</html>
```

style.css

```
h1,h2{
text-decoration: underline;
font-style: italic;
text-align: center;
}
#body{
background-color: tan;
border: red dotted;
text-align: center;
}
.div{
border: peru solid ;
}
*{
letter-spacing: 1px;
}
a:link{
color: black;
}
a:visited{
color: yellow;
}
a:hover{
color: green;
}
a:active{
color: blue;
}
ul li{
```

```
font-size: small;
}
```

OUTPUT



FLOWER

Flower sometimes known as a bloom or blossom, is the reproductive structure found in flowering plants. The flower is God's finest workmanship in the world. It is his finest gift to the mankind. We have seen the flowers of many kinds and to many colors. In India we see the flowers like

- Lily
- Lotus
- Rose
- Jasmine

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is CSS?
2. What are the different variations of CSS?
3. How can you integrate CSS on a web page?
4. What are the advantages of CSS?
5. What are the limitations of CSS?
6. What are the advantages of Embedded Style Sheets?
7. What is a CSS selector?
8. Explain universal selector.
9. Name the property used to specify the background color of an element.
10. What is the difference between inline, embedded and external style sheets?

RESULT

Thus a web page has been created with all types of CSS.

Ex No: 3

CLIENT SIDE SCRIPTS FOR VALIDATING WEB FORM CONTROLS USING DHTML

AIM

To create a DHTML for validating web form controls.

SOFTARE USED

Dreamweaver or Notepad and browser.

DESCRIPTION

DHTML stands for Dynamic HTML, it is totally different from HTML. The browsers which support the dynamic HTML are some of the versions of Netscape Navigator and Internet Explorer of version higher than 4.0. The DHTML is based on the properties of the HTML, javascript, CSS, and DOM (Document Object Model which is used to access individual elements of a document) which helps in making dynamic content. It is the combination of HTML, CSS, JS, and DOM. The DHTML make use of Dynamic object model to make changes in settings and also in properties and methods. It also makes uses of Scripting and it is also part of earlier computing trends.

ALGORITHM

1. The form will include one text field called "Your Name", and a submit button.

2. Validation script will ensure that the user enters their name before the form is sent to the server.

3. Open this page to see it in action.

4. Try pressing the Send Details button without filling anything in the "Your Name" field.

5. You might like to open the source code for this form in a separate window

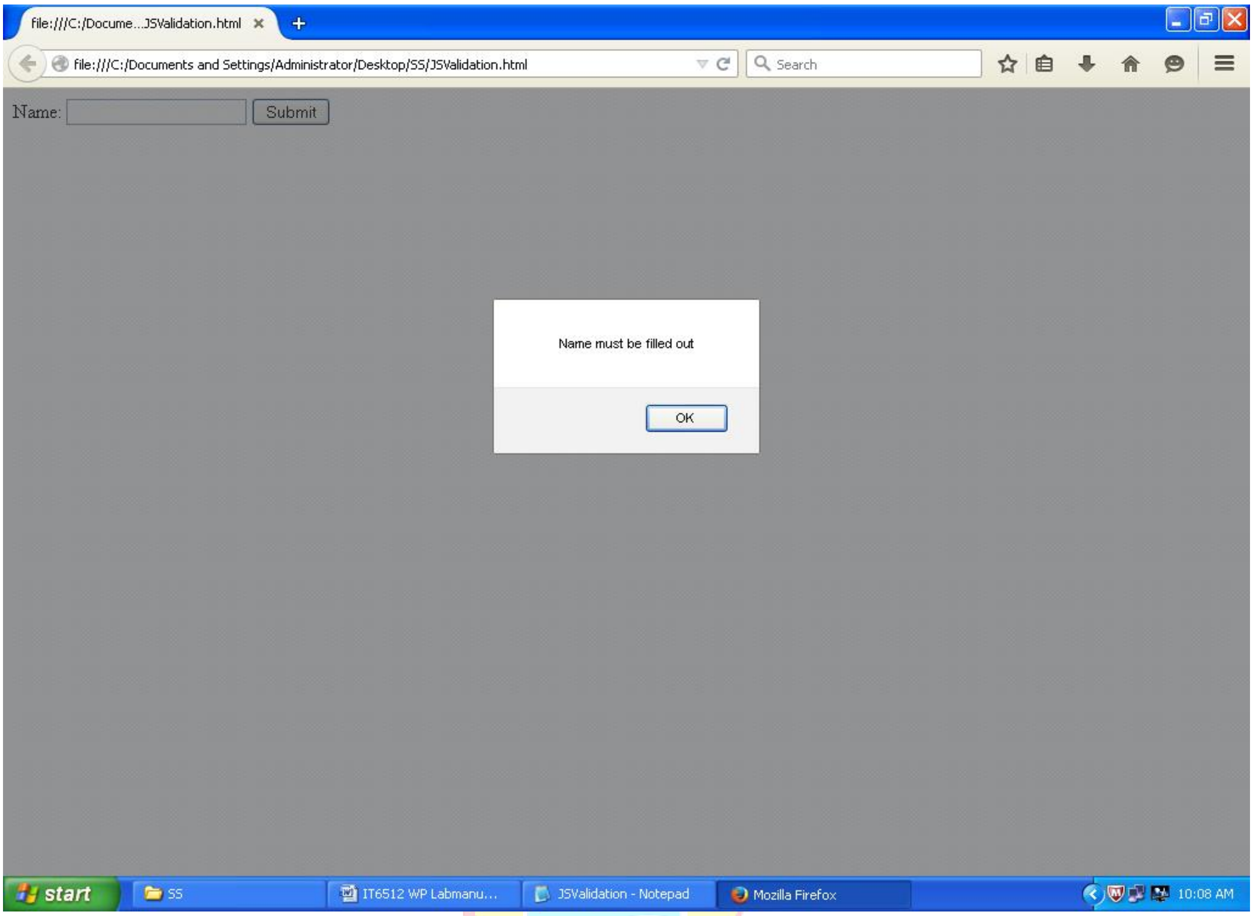
6. The page consists of a JavaScript function called validate_form() that performs the form validation, followed by the form itself.

CODE

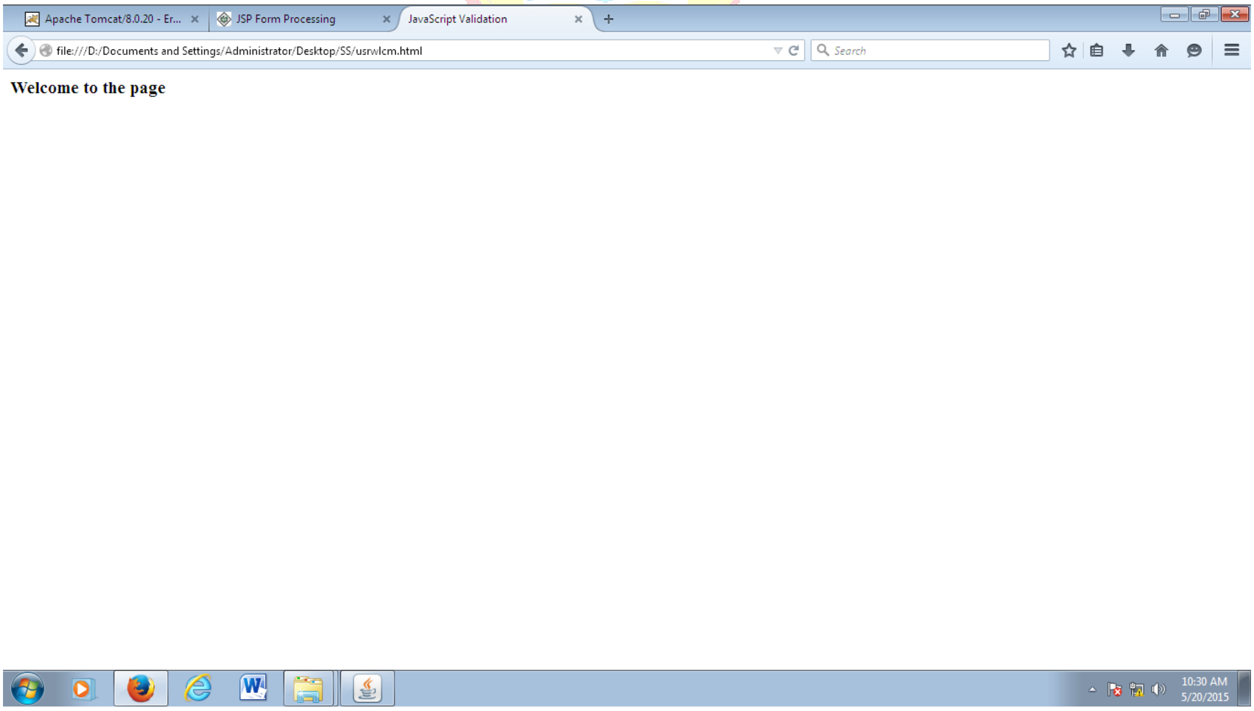
```
<!DOCTYPE html>
<html>
<head>
<script>
functionvalidateForm() {
var x = document.forms["myForm"]["fname"].value;
          if (x == null || x == "")
          {
alert("Name must be filled out");
return false;
          }
}
</script>
</head>
<body>
<form name="myForm" action="usrwlcm.html" onsubmit="return validateForm()"
method="post">
Name: <input type="text" name="fname">
```

```
<input type="submit" value="Submit">
</form>
</body>
</html>
```

OUTPUT


file:///C:/Docume...JSValidation.html
file:///C:/Documents and Settings/Administrator/Desktop/SS/JSValidation.html
Search
Name:
Submit
OK
start
SS
IT6512 WP Labmanu...
JSValidation - Notepad
Mozilla Firefox
10:08 AM

Name must be filled out


Apache Tomcat/8.0.20 - Er...
JSP Form Processing
JavaScript Validation
file:///D:/Documents and Settings/Administrator/Desktop/SS/usrwlcm.html
Search
10:30 AM
5/20/2015

Welcome to the page

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is DHTML?
2. Tell about technologies that we use in DHTML.
3. What are the features of DHTML?
4. What is the difference between HTML and DHTML?
5. How DHTML work with JavaScript?
6. How to use JavaScript with HTML event?
7. In how many ways a JavaScript code can be involved in an HTML file?
8. What is the main function of DOM?
9. What are the methods involved in HTML DOM?
10. Name the different types of pop up boxes in JavaScript.

RESULT

Thus the JavaScript to validate the form has been executed.

Ex No: 4

INSTALLATION OF APACHE TOMCAT WEB SERVER

Apache Tomcat HTTP Server

Apache Tomcat is a Java-capable HTTP server, which could execute special Java programs known as "Java Servlet" and "Java Server Pages (JSP)". Tomcat is an open-source project, under the "Apache Software Foundation" (which also provides the most use, open-source, industrial-strength Apache HTTP Server). The mother site for Tomcat is http://tomcat.apache.org. Alternatively, you can find tomcat via the Apache mother site @ http://www.apache.org.

Tomcat was originally written by James Duncan Davison (then working in Sun) in 1998, based on an earlier Sun's server called Java Web Server (JWS). It began at version 3.0 after JWS 2.1 it replaced. Sun subsequently made Tomcat open-source and gave it to Apache.

The various Tomcat releases are:

Tomcat 3.0 (1999): Reference Implementation (RI) for Servlet 2.2 and JSP 1.1.

Tomcat 4.1 (Sep 2002): RI for Servlet 2.3 and JSP 1.2.

Tomcat 5.0 (Dec 2003): RI for Servlet 2.4 and JSP 2.0.

Tomcat 6.0 (Feb 2007): RI for Servlet 2.5 and JSP 2.1.

Tomcat 7.0 (Jan 2011): RI for Servlet 3.0, JSP 2.2 and EL 2.2.

Tomcat 8.0 (Jun 2014): RI for Servlet 3.1, JSP 2.3, EL 3.0 and WebSocket 1.0. Tomcat 8.5 (June 2016) supports HTTP/2, OpenSSL, TLS virtual hosting and JASPIC 1.1.

Tomcat 9.0 (Jan 2018): RI for Servlet 4.0, JSP 2.3, EL 3.0, WebSocket 1.0, JASPIC 1.1.

Tomcat 10.0 (???):

How to Install Tomcat and Get Started with Java Servlet Programming

2.1 STEP 0: Create a Directory to Keep all your Works

I shall assume that you have created a directory called "c:\myWebProject" (for Windows) or "~\myWebProject" (for Mac OS X) in your earlier exercises. Do it otherwise. This step is important; otherwise, you will be out-of-sync with this article and will not be able to find your files later.

2.2 STEP 1: Download and Install Tomcat

For Windows

Goto http://tomcat.apache.org ⇒ Under "Tomcat 9.0.{xx} Released", where {xx} is the latest update number ⇒ Click "Download" ⇒ Under "9.0.{xx}" ⇒ Binary Distributions ⇒ Core ⇒ "zip" (e.g., "apache-tomcat-9.0.{xx}.zip", about 11 MB).

UNZIP the downloaded file into your project directory "c:\myWebProject". Tomcat shall be unzipped into directory "c:\myWebProject\apache-tomcat-9.0.{xx}".

For EASE OF USE, we shall shorten and rename this directory to "c:\myWebProject\tomcat".

Take note of Your Tomcat Installed Directory. Hereafter, I shall refer to the Tomcat installed directory as <TOMCAT_HOME>.

Tomcat's Sub-Directories

Take a quick look at the Tomcat installed directory. It contains the these sub-directories:

bin: contains the binaries and scripts (e.g., startup.bat and shutdown.bat for Windows; startup.sh and shutdown.sh for Unixes and Mac OS X).

conf: contains the system-wide configuration files, such as server.xml, web.xml, and context.xml.

webapps: contains the webapps to be deployed. You can also place the WAR (Webapp Archive) file for deployment here.

lib: contains the Tomcat's system-wide library JAR files, accessible by all webapps. You could also place external JAR file (such as MySQL JDBC Driver) here.

logs: contains Tomcat's log files. You may need to check for error messages here.

work: Tomcat's working directory used by JSP, for JSP-to-Servlet conversion.

STEP 2: Create an Environment Variable JAVA_HOME

(For Windows)

You need to create an environment variable (system variable available to all applications) called "JAVA_HOME", and set it to your JDK installed directory.

Many Java applications (such as Tomcat) require the environment variable JAVA_HOME to be set to the JDK installed directory.

To set the JAVA_HOME environment variable:

First, find your JDK installed directory. For JDK 11, the default is "c:\Program Files\Java\jdk-11.0.{x}", where "{x} is the update number. Use your "File Explorer" to find this directory and take note of your update number {x}.

Check if JAVA_HOME is already set. Start a CMD and issue:

set JAVA_HOME

If you get a message "Environment variable JAVA_HOME not defined", proceed to the next step.

If you get "JAVA_HOME=C:\Program Files\Java\jdk-11.0.{x}", verify that it is set correctly to your JDK directory. If not, proceed to the next step.

To set the environment variable JAVA_HOME in Windows 10:

Launch "Control Panel" ⇒ (Optional) "System and Security" ⇒ "System" ⇒ Click "Advanced system settings" on the left pane.

Switch to "Advanced" tab ⇒ Click "Environment Variables"

Under "System Variables" (the bottom pane) ⇒ Click "New" (or Look for "JAVA_HOME" and "Edit" if it is already set) ⇒ In "Variable Name", enter "JAVA_HOME" ⇒ In "Variable Value", enter your JDK installed directory you noted in Step 1. (In the latest Windows 10: you can push the "Browse Directory" button and navigate to the JDK installed directory to avoid typo error.)

To verify, RE-START a CMD (restart is needed to refresh the environment variables) and issue:

set JAVA_HOME

JAVA_HOME=c:\Program Files\Java\jdk-11.0.{x}   <== Verify that this is YOUR JDK installed directory

Notes: Windows' environment variables (such as JAVA_HOME, PATH) are NOT case-sensitive.

STEP 3: Configure the Tomcat Server

The Tomcat configuration files, in XML format, are located in the "conf" sub-directory of your Tomcat installed directory, e.g. "c:\myWebProject\tomcat\conf" (for Windows) or "~/myWebProject/tomcat/conf" (for Mac OS X). The important configuration files are:

server.xml

web.xml

context.xml

Make a BACKUP of the configuration files before you proceed!!!

Step 3(a) "conf\server.xml" - Set the TCP Port Number

Use a programming text editor (e.g., Sublime Text, Atom) to open the configuration file "server.xml".

The default TCP port number configured in Tomcat is 8080, you may choose any number between 1024 and 65535, which is not used by existing applications. We shall choose 9999 in this article. (For production server, you should use port 80, which is pre-assigned to HTTP server as the default port number.)

Locate the following lines (around Line 69) that define the HTTP connector, and change port="8080" to port="9999".

```
<!-- A "Connector" represents an endpoint by which requests are received
     and responses are returned. Documentation at :
     Java HTTP Connector: /docs/config/http.html
     Java AJP  Connector: /docs/config/ajp.html
     APR (HTTP/AJP) Connector: /docs/apr.html
     Define a non-SSL HTTP/1.1 Connector on port 8080
-->
<Connector port="9999" protocol="HTTP/1.1"
           connectionTimeout="20000"
           redirectPort="8443" />
```

Step 3(b) "conf\web.xml" - Enable Directory Listing

Again, use a programming text editor to open the configuration file "web.xml".

We shall enable directory listing by changing "listings" from "false" to "true" for the "default" servlet. This is handy for test system, but not for production system for security.

Locate the following lines (around Line 108) that define the "default" servlet; and change the "listings" from "false" to "true".

```
<servlet>
<servlet-name>default</servlet-name>
<servlet-class>org.apache.catalina.servlets.DefaultServlet</servlet-class>
<init-param>
<param-name>debug</param-name>
```

```
<param-value>0</param-value>
</init-param>
<init-param>
<param-name>listings</param-name>
<param-value>true</param-value>
</init-param>
<load-on-startup>1</load-on-startup>
</servlet>
```

Step 3(c) "conf\context.xml" - Enabling Automatic Reload

We shall add the attribute reloadable="true" to the <Context> element to enable automatic reload after code changes. Again, this is handy for test system but not recommended for production, due to the overhead of detecting changes.

Locate the <Context> start element (around Line 19), and change it to <Context reloadable="true">.

```
<Context reloadable="true">
  ......
  ......
</Context>
```

2.5 STEP 4: Start Tomcat Server

The Tomcat's executable programs and scripts are kept in the "bin" sub-directory of the Tomcat installed directory.

Step 4(a) Start Server

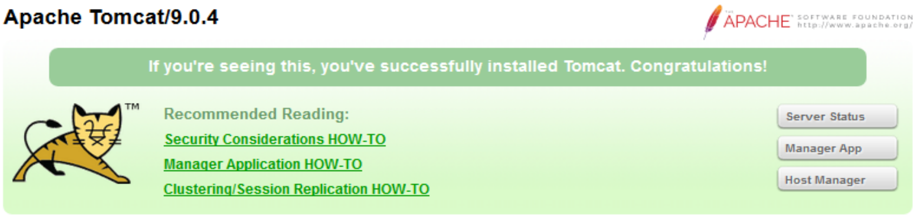
For Windows

I shall assume that Tomcat is installed in "c:\myWebProject\tomcat". Launch a CMD shell and issue:

```
c:                          // Change drive
cd \myWebProject\tomcat\bin  // Change directory to your Tomcat's binary directory
startup                      // Run startup.bat to start tomcat server
```

Step 4(b) Start a Client to Access the Server

Start a browser (Firefox, Chrome) as an HTTP client. Issue URL "http://localhost:9999" to access the Tomcat server's welcome page. The hostname "localhost" (with IP address of 127.0.0.1) is meant for local loop-back testing within the same machine. For users on the other machines over the net, they have to use the server's IP address or DNS domain name in the form of "http://*serverHostnameOrIPAddress*:9999".
(Optional) Try issuing URL http://localhost:9999/examples to view the servlet and JSP examples. Try running some of the servlet examples.



Apache Tomcat/9.0.4

If you're seeing this, you've successfully installed Tomcat. Congratulations!

Recommended Reading:

Security Considerations HOW-TO

Manager Application HOW-TO

Clustering/Session Replication HOW-TO

Step 4(c) Shutdown Server

For Windows

You can shutdown the tomcat server by either:

Press Ctrl-C on the Tomcat console; OR

Run "<TOMCAT_HOME>\bin\shutdown.bat" script. Open a new "cmd" and issue:

c:// Change the current drive

cd \myWebProject\tomcat\bin// Change directory to your Tomcat's binary directory

shutdown// Run shutdown.bat to shutdown the server

Ex No: 5

INVOKING SERVLETS FROM HTML FORMS-SESSION TRACKING

AIM

To create a simple application to perform session tracking using servlet.

SOFTWARE REQUIRED

Tomcat Server

DESCRIPTION

Session simply means a particular interval of time. Session Tracking is a way to maintain state (data) of an user. It is also known as session management in servlet.

Session Tracking Techniques

There are four techniques used in Session tracking:

- **Cookies**
- **Hidden Form Field**
- **URL Rewriting**
- **HttpSession**

ALGORITHM

client.html

1. Create a web page using HTML form that contains the fields such as text, password and one submit button.
2. Set the URL of the server as the value of form's action attribute.
3. Run the HTML program.
4. Submit the form data to the server.

server.java

1. Define the class server that extends the property of the class GenericServlet.
2. Handle the request from the client by using the method service() of GenericServlet class.
3. Get the parameter names from the HTML form by using the method getParameterNames().
4. Get the parameter values from the HTML forms by using the method getParameter().
5. Send the response to the client by using the method of PrintWriter class.

CODE

index.html

```
<!DOCTYPE html>
   <html>
   <head>
   <meta charset="ISO-8859-1">
   <title>Servlet Login Example</title>
   </head>
   <body>
   <h1>Welcome to Login App by Cookie</h1>
```

```
 <a href="login.html">Login</a>|
 <a href="LogoutServlet">Logout</a>|
 <a href="ProfileServlet">Profile</a>
 </body>
 </html>
```

link.html

```
 <a href="login.html">Login</a> |
 <a href="LogoutServlet">Logout</a> |
 <a href="ProfileServlet">Profile</a>
 <hr>
```

login.html

```
<form action="LoginServlet" method="post">
Name:<input type="text" name="name"><br>
Password:<input type="password" name="password"><br>
<input type="submit" value="login">
</form>
```

LoginServlet.java

```
package com.javatpoint;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class LoginServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
                          throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out=response.getWriter();

        request.getRequestDispatcher("link.html").include(request, response);

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

        if(password.equals("admin123")){
            out.print("You are successfully logged in!");
            out.print("<br>Welcome, "+name);

            Cookie ck=new Cookie("name",name);
            response.addCookie(ck);
        }else{
            out.print("sorry, username or password error!");
            request.getRequestDispatcher("login.html").include(request, response);
        }

        out.close();
    }

}
```

LogoutServlet.java

```
package com.javatpoint;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class LogoutServlet extends HttpServlet {
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
                        throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out=response.getWriter();
          request.getRequestDispatcher("link.html").include(request, response);
        Cookie ck=new Cookie("name","");
        ck.setMaxAge(0);
        response.addCookie(ck);
         out.print("you are successfully logged out!");
    }
}
```

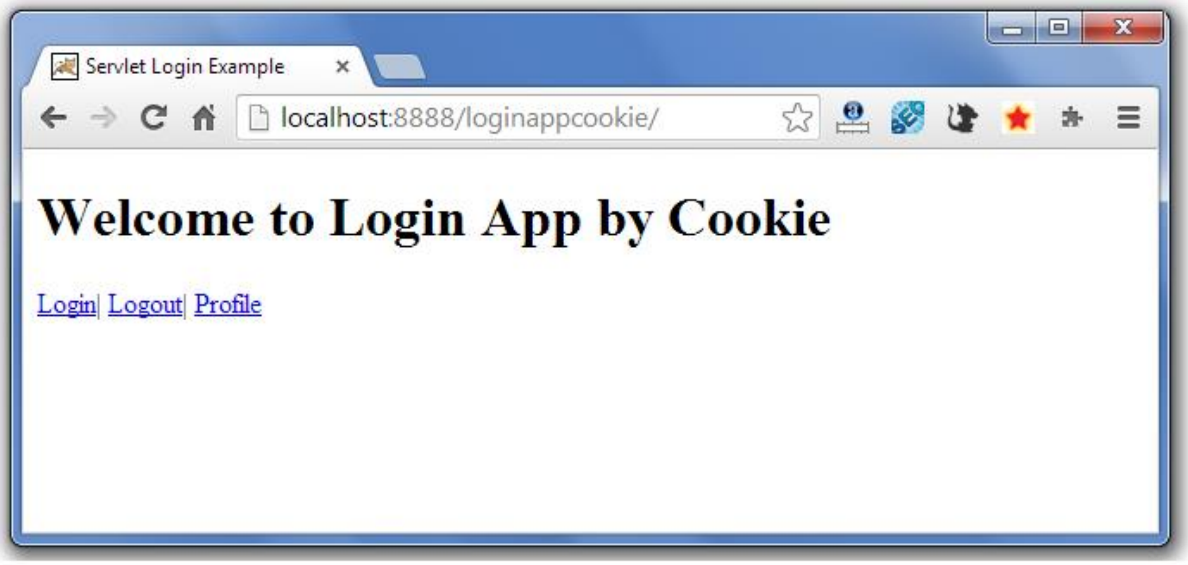
File: ProfileServlet.java

```
package com.javatpoint;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class ProfileServlet extends HttpServlet {
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
                          throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out=response.getWriter();

        request.getRequestDispatcher("link.html").include(request, response);

        Cookie ck[]=request.getCookies();
        if(ck!=null){
         String name=ck[0].getValue();
        if(!name.equals("")||name!=null){
            out.print("<b>Welcome to Profile</b>");
            out.print("<br>Welcome, "+name);
        }
        }else{
            out.print("Please login first");
            request.getRequestDispatcher("login.html").include(request, response);
        }
        out.close();
    }
}
```

web.xml

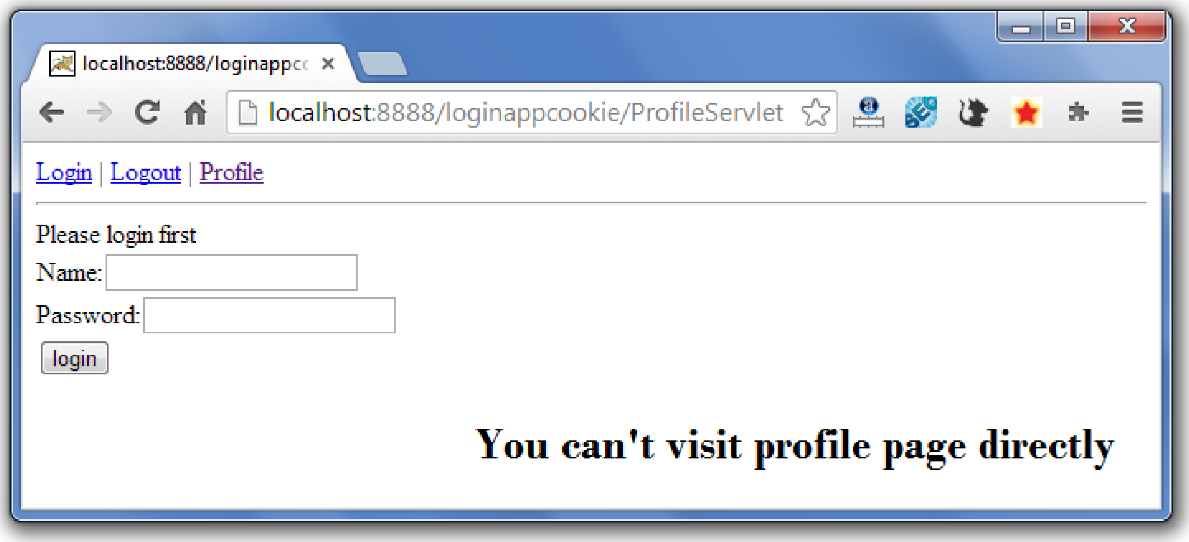
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee" xsi:schemaLocation="http://java.sun.com/xml
/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd" id="WebApp_ID" version="2.5">

  <servlet>
    <description></description>
    <display-name>LoginServlet</display-name>
    <servlet-name>LoginServlet</servlet-name>
    <servlet-class>com.javatpoint.LoginServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>LoginServlet</servlet-name>
    <url-pattern>/LoginServlet</url-pattern>
  </servlet-mapping>
  <servlet>
    <description></description>
    <display-name>ProfileServlet</display-name>
    <servlet-name>ProfileServlet</servlet-name>
    <servlet-class>com.javatpoint.ProfileServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>ProfileServlet</servlet-name>
    <url-pattern>/ProfileServlet</url-pattern>
  </servlet-mapping>
  <servlet>
    <description></description>
    <display-name>LogoutServlet</display-name>
    <servlet-name>LogoutServlet</servlet-name>
    <servlet-class>com.javatpoint.LogoutServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>LogoutServlet</servlet-name>
    <url-pattern>/LogoutServlet</url-pattern>
  </servlet-mapping>
</web-app>
```

OUTPUT



Welcome to Login App by Cookie

Login| Logout| Profile


localhost:8888/loginappcc
localhost:8888/loginappcookie/ProfileServlet

Login | Logout | Profile

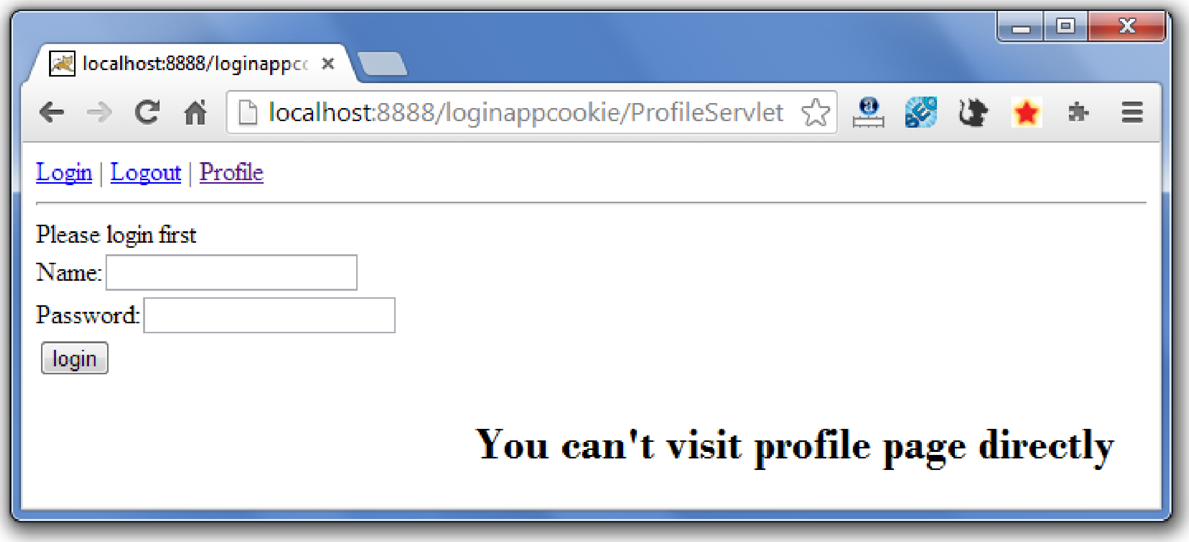
Please login first

Name:

Password:

login

You can't visit profile page directly


localhost:8888/loginappcc
localhost:8888/loginappcookie/ProfileServlet

Login | Logout | Profile

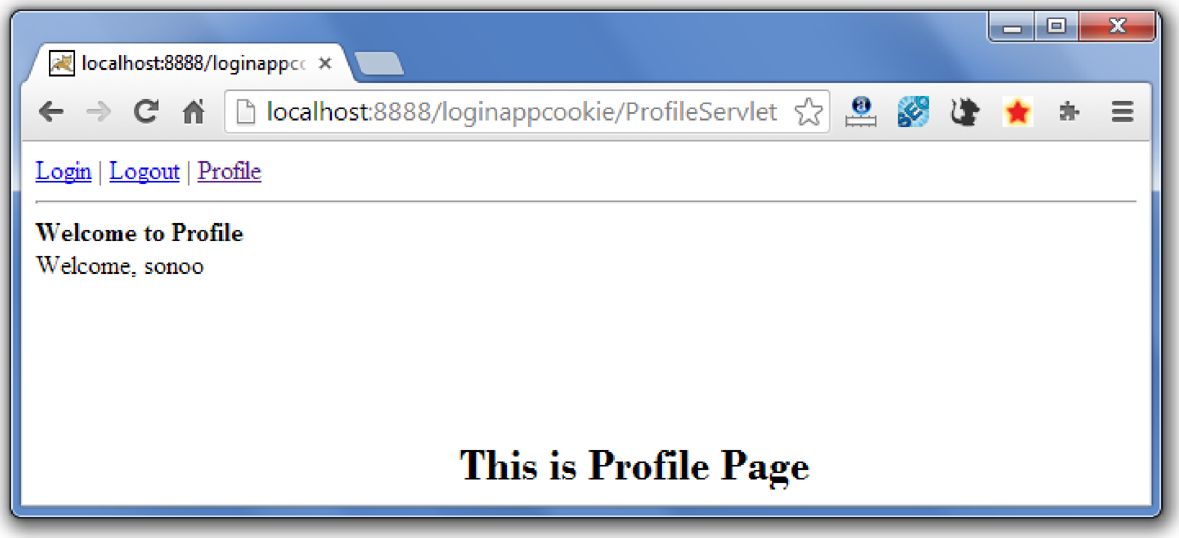
Please login first

Name:

Password:

login

You can't visit profile page directly



Login | Logout | Profile

Welcome to Profile
Welcome, sonoo

This is Profile Page

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is server side scripting?
2. What are the advantages and disadvantages of server side scripting?
3. What are the differences between client and server side scripting?
4. What is a servlet?
5. What are the advantages of Servlet over CGI?
6. How many objects of a servlet is created?
7. What is the life-cycle of a servlet?
8. Who is responsible to create the object of servlet?
9. When servlet object is created?
10. What is difference between Get and Post method?

RESULT

Thus a simple application has been created for invoking servlets from HTML forms.

Ex No: 6a

CREATION OF THREE-TIER APPLICATIONS USING JSP AND DATABASES - For conducting on-line examination

AIM

To create a three-tier application using JSP and Databases for the conduction of online-examination.

SOFTWARE REQUIRED

Tomcat Server

DESCRIPTION

Java Server Pages (JSP) is a technology that helps software developers create dynamically generated web pages based on HTML, XML, or other document types. Released in 1999 by Sun Microsystems, JSP is similar to PHP and ASP, but it uses the Java programming language.

ALGORITHM

1. Design the HTML page (ExamClient.html) with the following
   a. Create a form to get the input from the user.
   b. Use radio buttons to make various options for the questions.
   c. Set the URL of the server (ExamServer.jsp) as the value of the action attribute.
   d. Use submit button to invoke the server and send the form data to the server.
2. Create the JSP file with the following
   a. Read the input from the client.
   b. Retrieve the answers from the database.
   c. Match the answers from the user with the correct answers from the database table.
   d. For each correct answer increment the mark by 5.
   e. Server displays the mark and result to the client as a response.

CODE

ExamServer.jsp:

```
<%@page contentType="text/html" language="java" import="java.sql.*"%>
<html>
<head>
<title>Online Exam Server</title>
<style type="text/css">
  body{background-color:black;font-family:courier;color:blue}
</style>
</head>
<body>
<h2 style="text-align:center">ONLINE EXAMINATION</h2>
<p>
<a href="ExamClient.html">Back To Main Page</a>
</p>
<hr/>
<%
String str1=request.getParameter("ans1");
String str2=request.getParameter("ans2");
String str3=request.getParameter("ans3");
```

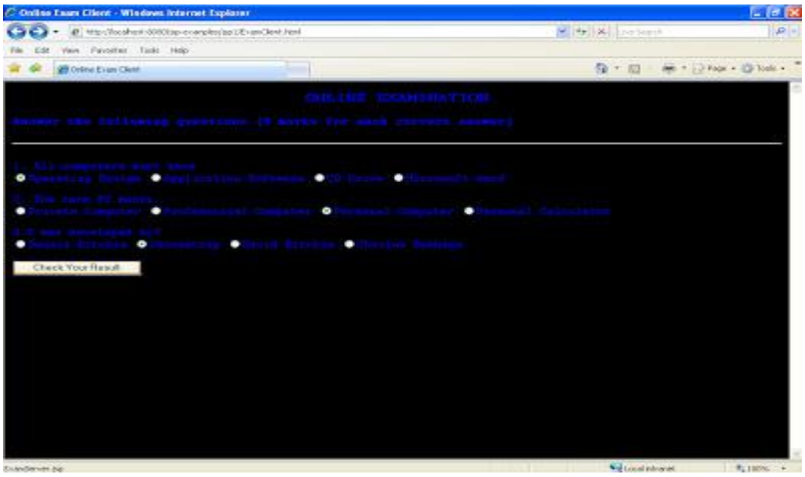
```
int mark=0;
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
Connection con=DriverManager.getConnection("jdbc:odbc:examDS");
Statement stmt=con.createStatement();
ResultSet rs=stmt.executeQuery("SELECT * FROM examTab");
int i=1;
while(rs.next())
{
 if(i==1)
 {
  String dbans1=rs.getString(1);
  if(str1.equals(dbans1))
  {
   mark=mark+5;
  }
 }
 if(i==2)
 {
  String dbans2=rs.getString(1);
  if(str2.equals(dbans2))
  {
   mark=mark+5;
  }
 }
 if(i==3)
 {
  String dbans3=rs.getString(1);
  if(str3.equals(dbans3))
  {
   mark=mark+5;
  }
 }
 i++;
}
if(mark>=10)
{
 out.println("<h4>Your Mark Is : "+mark+"</h4>");
 out.println("<h3>Congratulations....! You Are Eligible For The Next Round...</h3>");
}
else
{
 out.println("<h4>Your Mark is : "+mark+"</h4>");
 out.println("<h3>Sorry....!! You Are Not Eligible For  The Next Round...</h3>");
}
%>
</form>
</body>
</html>
```

ExamClient.HTML:

```
<html>
```

```
<head>
<title>Online Exam Client</title>
<style type="text/css">
  body{background-color:black;font-family:courier;color:blue}
</style>
</head>
<body>
<h2 style="text-align:center">ONLINE EXAMINATION</h2>
<h3>Answer the following questions (5 marks for each correct answer)</h3>
<hr/>
<form name="examForm" method="post" action="ExamServer.jsp">
1. All computers must have <br/>
<input type="radio" name="ans1" value="Operating System">Operating System
<input type="radio" name="ans1" value="Application Software">Application Software
<input type="radio" name="ans1" value="CD Drive">CD Drive
<input type="radio" name="ans1" value="Microsoft word">Microsoft word
<br/><br/>
2. The term PC means <br/>
<input type="radio" name="ans2" value="Private Computer">Private Computer
<input type="radio" name="ans2" value="Professional Computer">Professional Computer
<input type="radio" name="ans2" value="Personal Computer">Personal Computer
<input type="radio" name="ans2" value="Personal Calculator">Personal Calculator
<br/><br/>
3.C was developed by?<br/>
<input type="radio" name="ans3" value="Dennis Ritchie">Dennis Ritchie
<input type="radio" name="ans3" value="Stroustrup">Stroustrup
<input type="radio" name="ans3" value="David Ritchie">David Ritchie
<input type="radio" name="ans3" value="Charles Babbage">Charles Babbage
<br/><br/>
<input type="submit" value="Check Your Result"/>
</form>
</body>
</html>
```

OUTPUT



Online Exam Client - Windows Internet Explorer
http://localhost:8080/jsp-examples/jsp1/ExamClient.html
File Edit View Favorites Tools Help
Online Exam Client
Page Tools
ExamServer.jsp
Local intranet
100%

ONLINE EXAMINATION

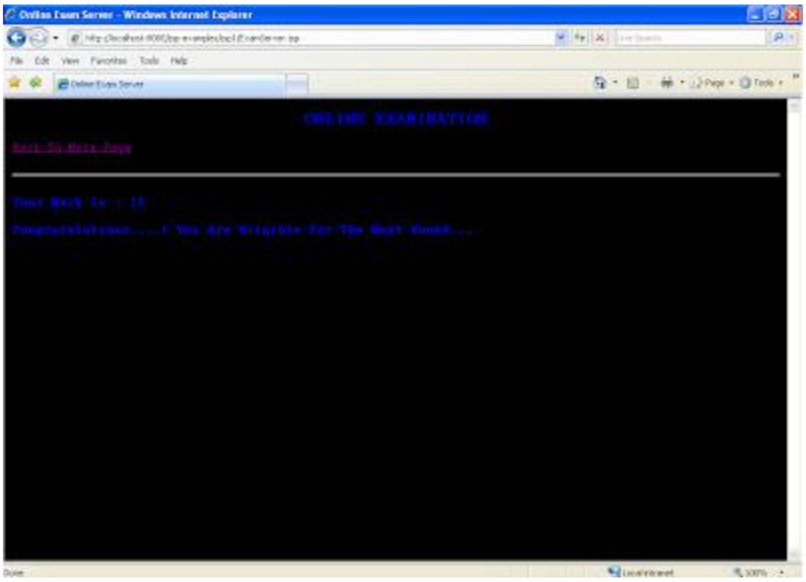
Answer the following questions (5 marks for each correct answer)

1. All computers must have
◉ Operating System ○ Application Software ○ CD Drive ○ Microsoft word

2. The term PC means
○ Private Computer ○ Professional Computer ◉ Personal Computer ○ Personal Calculator

3.C was developed by?
○ Dennis Ritchie ◉ Stroustrup ○ David Ritchie ○ Charles Babbage

Check Your Result



Online Exam Server - Windows Internet Explorer
File Edit View Favorites Tools Help
Online Exam Server
Page
Tools

```
ONLINE EXAMINATION

Back To Main Page

Your Mark Is : 15

Congratulations....! You Are Eligible For The Next Round...
```

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is JSP?
2. What are the advantages of JSP over Servlet?
3. What is the use of 'out' implicit object?
4. What is EL in JSP?
5. What is JSTL?
6. What is JDBC?
7. What are the steps to connect to the database in java?
8. What are the JDBC API components?
9. What are the JDBC statements?
10. Define ResultSet.

RESULT

Thus a simple web application using JSP and Database had been created for the conduction of online examination.

Ex No: 6b

CREATION OF THREE-TIER APPLICATIONS USING JSP AND DATABASES - For displaying student mark list

AIM

To create a three-tier application using JSP and Databases for displaying the student mark list.

SOFTWARE REQUIRED

Tomcat Server

DESCRIPTION

Java Server Pages (JSP) is a technology that helps software developers create dynamically generated web pages based on HTML, XML, or other document types. Released in 1999 by Sun Microsystems, JSP is similar to PHP and ASP, but it uses the Java programming language.

ALGORITHM

1. Design the HTML page (stud.html) with the following
   a. Create a form to get the input (Register Number) from the user.
   b. Set the URL of the server (marklist.jsp) as the value of the action attribute.
   c. Use submit button to invoke the server and send the form data to the server.
2. Create the JSP file with the following
   a. Read the parameter value (Register Number) from the form by using the method getParameter().
   b. Server retrieves the details from the database table with respect to the form input.
   c. Server displays the mark list to the client as the response.

CODE

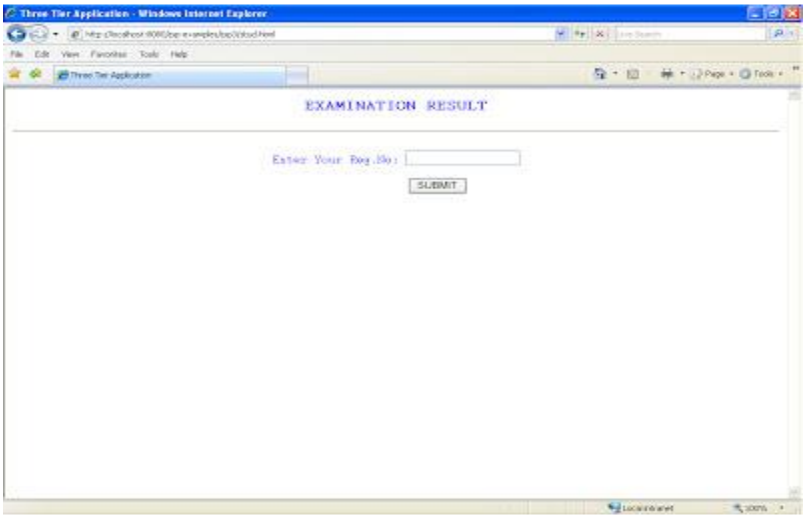
marklist.jsp:

```
<%@ page contentType="text/html" language="java" import="java.sql.*"%>
<html>
<head>
<title>Three Tier Application</title>
<style type="text/css">
 body{color:blue;font-family:courier;text-align:center}
</style>
</head>
<body>
<h2>EXAMINATION RESULT</h2><hr/>
<%
String str=request.getParameter("regno");
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
Connection con=DriverManager.getConnection("jdbc:odbc:markDS");
Statement stmt=con.createStatement();
ResultSet rs=stmt.executeQuery("SELECT*FROM markTab WHERE rno="+str);
while(rs.next())
{
%>
Register No:<%=rs.getObject(1)%><br/>
Name:<%=rs.getObject(2)%><br/>
<table border="1">
<th>SUBJECT</th><th>Mark</th>
<tr><td>Network Programming and
Management</td><td><%=rs.getObject(3)%></td></tr>
<tr><td>Object Oriented Analysis and Design</td><td><%=rs.getObject(4)%></td></tr>
<tr><td>Cryptography and Network Security</td><td><%=rs.getObject(5)%></td></tr>
<tr><td>Embedded Systems</td><td><%=rs.getObject(6)%></td></tr>
<tr><td>Web Technology</td><td><%=rs.getObject(7)%></td></tr>
<tr><td>Software Requirement and Engineering</td><td><%=rs.getObject(8)%></td></tr>
</table>
<%
}
%>
<br/>
<a href="stud.html">Back</a>
</body>
</html>
```

stud.html

```
<html>
<head>
<title>Three Tier Application</title>
<style type="text/css">
 body{color:blue;font-family:courier;text-align:center}
</style>
</head>
<body>
<h2>EXAMINATION RESULT</h2><hr/>
<form name="f1" method"GET" action="marklist.jsp">
Enter Your Reg.No:
<input type="text" name="regno"/><br/><br/>
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;
&nbsp;&nbsp;&nbsp;&nbsp;
<input type="submit" value="SUBMIT"/>
</form>
</body>
<html>
```

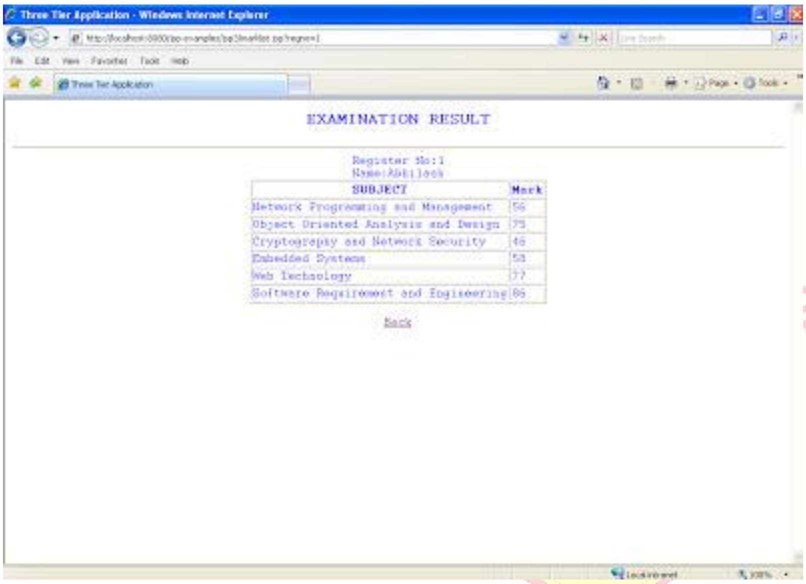
OUTPUT


Three Tier Application - Windows Internet Explorer
http://localhost:8080/jsp-examples/jsp3/stud.html
File Edit View Favorites Tools Help
Three Tier Application
Page
Tools
Local intranet
100%

EXAMINATION RESULT

Enter Your Reg.No:

SUBMIT


Three Tier Application - Windows Internet Explorer
http://localhost:8080/jsp-examples/jsp3/marklist.jsp?regno=1
File Edit View Favorites Tools Help
Three Tier Application
Page
Tools
Local intranet
100%

EXAMINATION RESULT

Register No:1
Name:Abilash

SUBJECT	Mark
Network Programming and Management	56
Object Oriented Analysis and Design	75
Cryptograpy and Network Security	46
Embedded Systems	58
Web Technology	77
Software Requirement and Engineering	86

Back

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is JSP?
2. What are the advantages of JSP over Servlet?
3. What is the use of 'out' implicit object?
4. What is EL in JSP?
5. What is JSTL?
6. What is JDBC?
7. What are the steps to connect to the database in java?
8. What are the JDBC API components?
9. What are the JDBC statements?
10. Define ResultSet.

RESULT

Thus a simple web application using JSP and Database had been created displaying student mark list.

Ex No: 7

PROGRAMS USING XML – SCHEMA – XSLT/XSL

AIM

To write a XML scheme to generate CD Collection details.

SOFTWARE REQUIRED

Dreamweaver or Notepad and Browser.

DESCRIPTION

In HTML documents, tags are predefined but in XML documents, tags are not predefined. World Wide Web Consortium (W3C) developed XSL to understand and style an XML document, which can act as XML based Stylesheet Language.

An XSL document specifies how a browser should render an XML document.

Main parts of XSL Document

- XSLT: It is a language for transforming XML documents into various other types of documents.
- XPath: It is a language for navigating in XML documents.
- XQuery: It is a language for querying XML documents.
- XSL-FO: It is a language for formatting XML documents.

How XSLT Works?

The XSLT stylesheet is written in XML format. It is used to define the transformation rules to be applied on the target XML document. The XSLT processor takes the XSLT stylesheet and applies the transformation rules on the target XML document and then it generates a formatted document in the form of XML, HTML, or text format. At the end it is used by XSLT formatter to generate the actual output and displayed on the end-user.

ALGORITHM

```
Step 1: Start the program
Step 2: Use Xml Style Sheet code to define link
        <?xml-stylesheet type="text/xsl" href="yourxsl.xsl"?>
Step 3: Use the catalog tag to define CD collection details.
Step 4: Use the necessary heading for appropriate XML tag.
Step 5: Provide necessary information for CD collection details
Step 6: Stop the program
```

CODE

CDCatalog.xml

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!-- Edited by XMLSpy® -->
<?xml-stylesheet type="text/xsl" href=" CDCatalog.xsl"?>
<catalog>
<cd>
<title>Empire Burlesque</title>
<artist>Bob Dylan</artist>
<country>USA</country>
<company>Columbia</company>
<price>10.90</price>
```

```
<year>1985</year>
</cd>
<cd>
<title>Hide your heart</title>
<artist>Bonnie Tyler</artist>
<country>UK</country>
<company>CBS Records</company>
<price>9.90</price>
<year>1988</year>
</cd>
<cd>
<title>Greatest Hits</title>
<artist>Dolly Parton</artist>
<country>USA</country>
<company>RCA</company>
<price>9.90</price>
<year>1982</year>
</cd>
</catalog>
```

CDCatalog.xsl

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<xsl:stylesheet version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:template match="/">
<html>
<body>
<h2>My CD Collection</h2>
<table border="1">
<tr bgcolor="#9acd32">
<th>Title</th>
<th>Artist</th>
</tr>
<xsl:for-each select="catalog/cd">
<xsl:sort select="artist"/>
<tr>
<td><xsl:value-of select="title"/></td>
<td><xsl:value-of select="artist"/></td>
</tr>
</xsl:for-each>
</table>
</body>
</html>
</xsl:template>
</xsl:stylesheet>
```

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is XML?
2. What are the features of XML?
3. What are the differences between HTML and XML?
4. What is an attribute?
5. What are the basic rules while writing XML?
6. What is an XML Schema?
7. What is well formed XML document?
8. Can I replace HTML with XML?
9. Why XSLT is important for XML?
10. What are the three parts of XSL?

RESULT

Thus an XML application had been created to display CD Catalog using XSL.

Ex No: 8

PROGRAMS USING DOM AND SAX PARSERS

AIM

To write a java code using DOM and SAX API for parsing an XML document and check whether it is well formatted or not.

SOFTWARE REQUIRED

Java

DESCRIPTION

1) DOM parser loads whole XML documents in memory while SAX only loads a small part of the XML file in memory.

2) DOM parser is faster than SAX because it accesses the whole XML document in memory.

3) SAX parser in Java is better suitable for a large XML file than DOM Parser because it doesn't require much memory.

4) DOM parser works on Document Object Model while SAX is an event based XML parser.

ALGORITHM

Step 1: Start the program.
Step 2: Create an XML document containing student's information.
Step 3: Write a java code that import the various DOM and SAX related classes to parse the XML document.
Step 4: Compile and run the java file which parses the document and displays whether the created XML document is correctly formatted.
Step 5: Stop the program.

CODE

student.xml

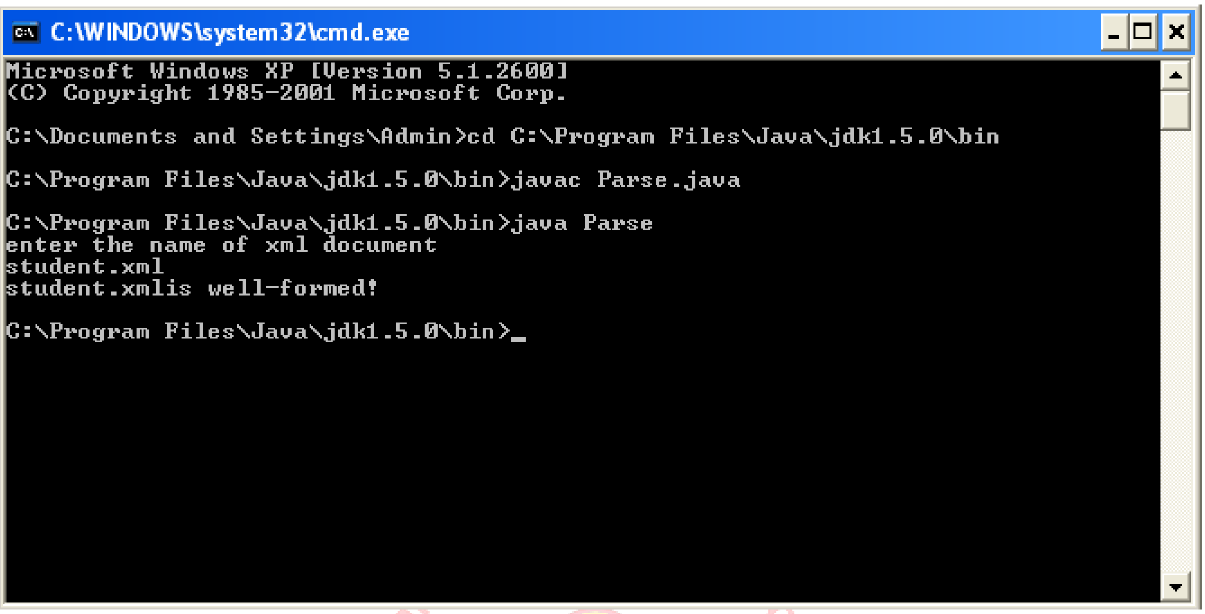
```
<?xml version="1.0"?>
 <student>
<Roll_No>10</Roll_No>
 <Personal_Info>
<Name>parth</Name>
 <Address>pune</Address>
<Phone>1234567890</Phone>
 </Personal_Info>
<Class>Second</Class>
 <Subject>Maths</Subject>
<Marks>100</Marks>
 <Roll_No>20</Roll_No>
<Personal_Info>
 <Name>AnuRadha</Name>
<Address>Bangalore</Address>
 <Phone>90901233</Phone>
</Personal_Info>
```

```
 <Class>Fifth</Class>
<Subject>English</Subject>
 <Marks>90</Marks>
<Roll_No>30</Roll_No>
 <Personal_Info>
<Name>Anand</Name>
 <Address>Mumbai</Address>
<Phone>90901256</Phone>
 </Personal_Info>
<Class>Fifth</Class>
 <Subject>English</Subject>
<Marks>90</Marks>
 </student>
```

parse.java

```
import java.io.*;
import javax.xml.parsers.*;
import org.w3c.dom.*;
import org.xml.sax.*;
public class Parse
{
public static void main(String[] arg)
{
try
{
System.out.println("enter the name of xml document");
BufferedReader input=new BufferedReader(new InputStreamReader(System.in));
String file_name=input.readLine();
File fp=new File(file_name);
if(fp.exists())
{
try
{
DocumentBuilderFactory Factory_obj=DocumentBuilderFactory.newInstance();
DocumentBuilder builder=Factory_obj.newDocumentBuilder();
InputSource ip_src=new InputSource(file_name);
Document doc=builder.parse(ip_src);
System.out.println(file_name+" is well-formed!");
}
catch(Exception e)
{
System.out.println(file_name+" isn't well-formed!");
System.exit(1);
}
}
else
{
System.out.print("file not found!");
}
}
catch(IOException ex)
{
ex.printStackTrace();
}
}
}
```

OUTPUT



```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Admin>cd C:\Program Files\Java\jdk1.5.0\bin

C:\Program Files\Java\jdk1.5.0\bin>javac Parse.java

C:\Program Files\Java\jdk1.5.0\bin>java Parse
enter the name of xml document
student.xml
student.xmlis well-formed!

C:\Program Files\Java\jdk1.5.0\bin>_
```

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What are the types of XML parser?
2. What are the features of DOM parser?
3. What are the features of SAX parser?
4. Differentiate between DOM and SAX parser.
5. What are the advantages of DOM parser?
6. What are the disadvantages of DOM parser?
7. What are the advantages of SAX parser?
8. What are the disadvantages of SAX parser?

RESULT

Thus the program to parse XML document had been created using DOM and SAX API.

Ex No: 9

PROGRAMS USING AJAX

AIM

To write a java script program for a AJAX.

SOFTWARE REQUIRED

Dreamweaver or Notepad and Browser.

DESCRIPTION

AJAX stands for Asynchronous JavaScript and XML. AJAX is a new technique for creating better, faster, and more interactive web applications with the help of XML, HTML, CSS, and Java Script.

- Ajax uses XHTML for content, CSS for presentation, along with Document Object Model and JavaScript for dynamic content display.
- Conventional web applications transmit information to and from the sever using synchronous requests. It means you fill out a form, hit submit, and get directed to a new page with new information from the server.
- With AJAX, when you hit submit, JavaScript will make a request to the server, interpret the results, and update the current screen. In the purest sense, the user would never know that anything was even transmitted to the server.
- XML is commonly used as the format for receiving server data, although any format, including plain text, can be used.
- AJAX is a web browser technology independent of web server software.
- A user can continue to use the application while the client program requests information from the server in the background.
- Intuitive and natural user interaction. Clicking is not required, mouse movement is a sufficient event trigger.
- Data-driven as opposed to page-driven.

ALGORITHM

Step 1 Start the program.
Step 2 A scripting language that is commonly hosted in a browser to add Interactivity to HTML PAGES.
Step 3 Defines the structure of a webpage as a set of programmable objects that can be accessed through JavaScript.
Step 4 Allows a client-side script to perform and httprequest.
Step 5 AJAX applications use xmlhttprequest object to perform asynchronous requests to the server as opposed to performing a full page refresh.
Step 6 Display the result.
Step 7 Stop the program.

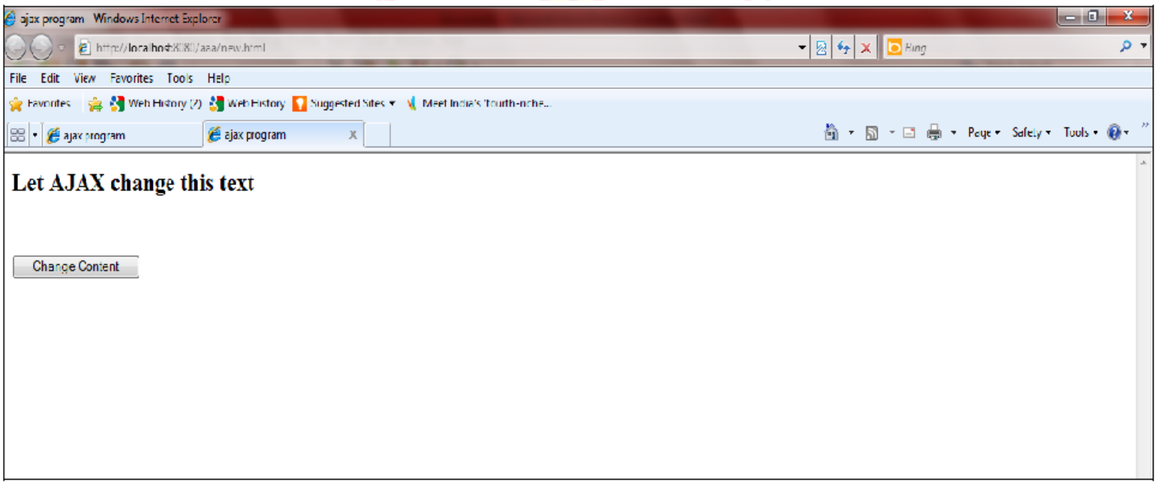
CODE

```
<html>
<head>
<script type="text/javascript">
functionloadXMLDoc()
{
if (window.XMLHttpRequest)
xmlhttp=new XMLHttpRequest();
else
xmlhttp=new ActiveXObject("Microsoft.XMLHTTP");
xmlhttp.onreadystatechange=function()
{
if (xmlhttp.readyState==4 &&xmlhttp.status==200)
{
document.getElementById("myDiv").innerHTML=xmlhttp.responseText;
}
}
xmlhttp.open("GET","new.txt",true);
xmlhttp.send();
}
</script>
<title>ajax program</title>
</head>
<body>
<div id="myDiv"><h2>Let AJAX change this text</h2></div>
<button type="button" onclick="loadXMLDoc()">Change Content</button>
</body>
</html>
```

New.txt:

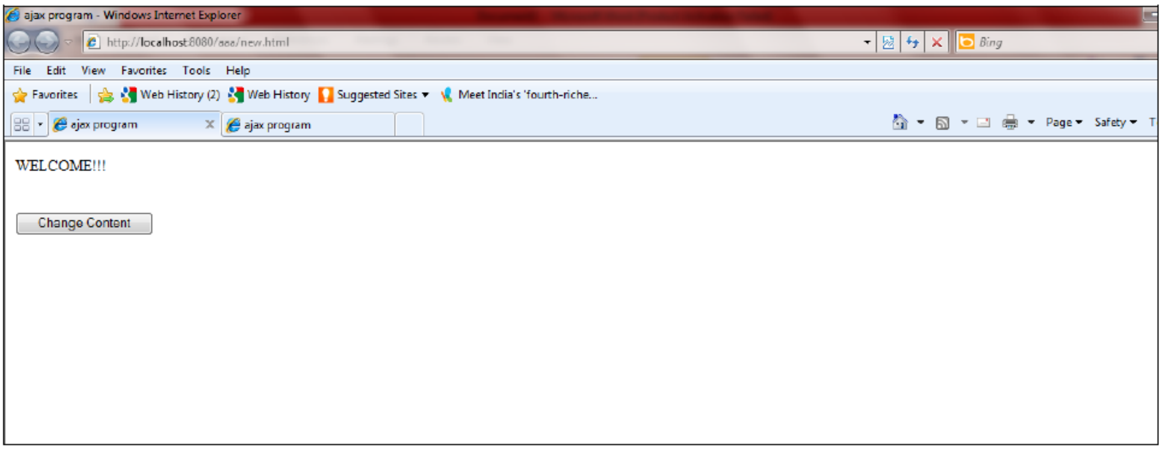
WELCOME!!!

OUTPUT



ajax program - Windows Internet Explorer
http://localhost:8080/aaa/new.html
Bing
File Edit View Favorites Tools Help
Favorites
Web History (2)
Web History
Suggested Sites
Meet India's 'fourth-riche...
ajax program
ajax program
Page
Safety
Tools
Change Content

Let AJAX change this text



ajax program - Windows Internet Explorer
http://localhost:8080/aaa/new.html
Bing
File Edit View Favorites Tools Help
Favorites
Web History (2)
Web History
Suggested Sites
Meet India's 'fourth-riche...
ajax program
ajax program
Page
Safety
Change Content

WELCOME!!!

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is AJAX?
2. What are the advantages of AJAX?
3. What are the disadvantages of AJAX?
4. What are the real web applications of AJAX currently running in the market?
5. What are the technologies used by AJAX?
6. What is the purpose of XMLHttpRequest?
7. What are the properties of XMLHttpRequest?
8. What are the important methods of XMLHttpRequest?
9. What are the types of open() method used for XMLHttpRequest?
10. What is the role of the callback function in AJAX?

RESULT

Thus the program using AJAX had been created.

Ex No: 10

PROGRAM USING WEB SERVICE AND DATABASE

AIM

To create a web service for travel service using NetBeans.

SOFTWARE REQUIRED

NetBeans

DESCRIPTION

A web service is any piece of software that makes itself available over the internet and uses a standardized XML messaging system. XML is used to encode all communications to a web service. For example, a client invokes a web service by sending an XML message, then waits for a corresponding XML response.

Web services allows you to expose the functionality of your existing code over the network. Once it is exposed on the network, other application can use the functionality of your program. Web services allow various applications to talk to each other and share data and services among themselves.

ALGORITHM

1. Using the NetBeans API create a project of the type web application.
2. Establish connectivity with the database along with the necessary authentication parameters.
3. Create a web service in the project.
4. Click on the Design tab and design the prototype of the web service.
5. Click on source tab and modify the application logic of the web service.
6. Save the project.
7. Right click on the project and click on deploy and undeploy.
8. Then test the web service.
9. Create another web application project and create a jsp file.
10. Right click on project and click on create web service client.
11. Browse and choose the web service created i.e wsdl url
12. Drag and drop the web service reference to the source code window.
13. Then pass the appropriate parameters to the web service client and invoke the web service.

STEPS FOR CREATING TRAVEL WEB SERVICE

Requirements:

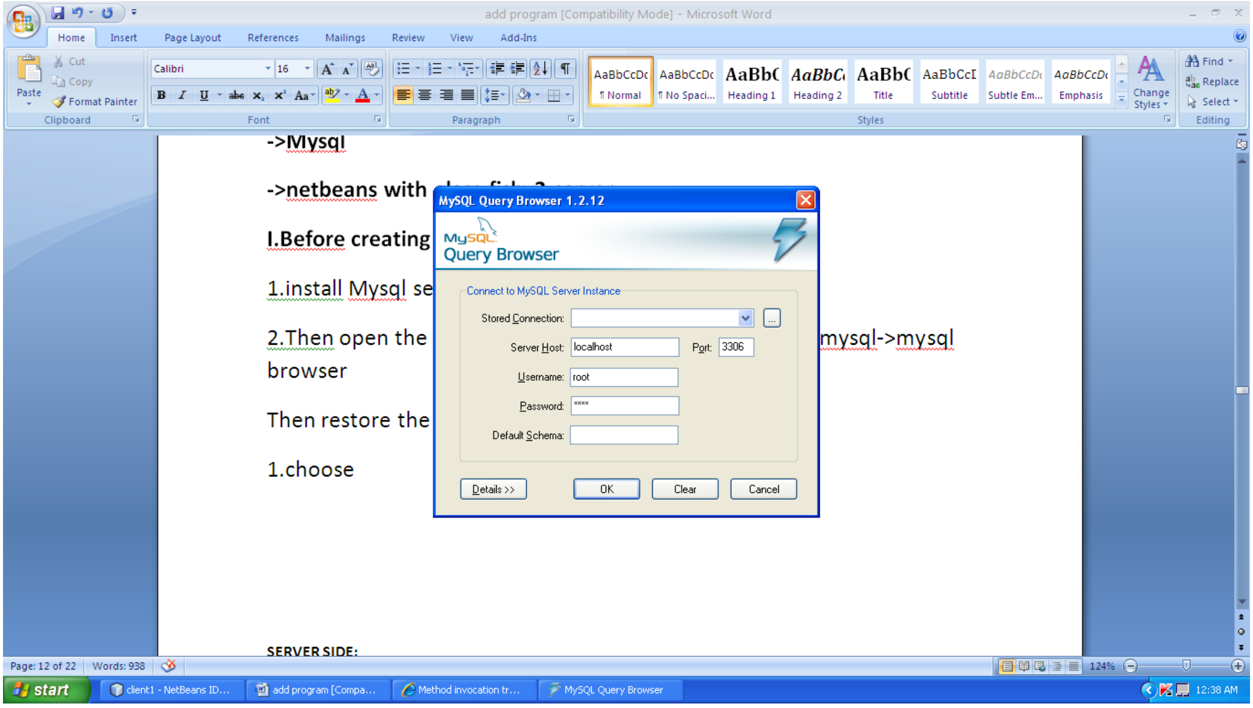
->Mysql

->netbeans with glass fishv2 server

I. Before creating project in net beans do the following:

1. install Mysql setup file and the gui tools .

2. Then open the mysql browser in the start->programs->mysql->mysql browser



MySQL Query Browser 1.2.12

Connect to MySQL Server Instance

Stored Connection:

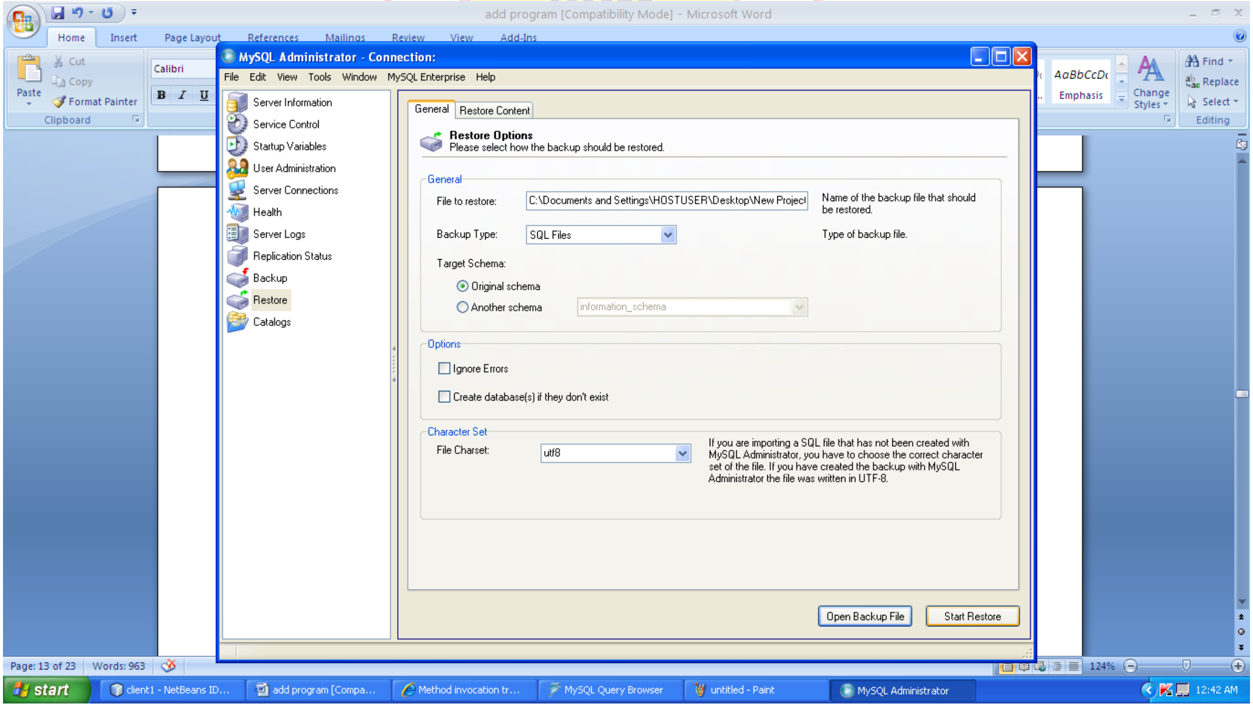
Server Host: localhost Port: 3306

Username: root

Password: ****

Default Schema:

Then restore the back up (newproject2011…) as follows
1. choose tools->mysql administrator
2. Then choose restore in that window..Then click open backup in the bottom…open the backup file(newproject201….) which is in the attachment….then click start restore..



Restore Options
Please select how the backup should be restored.

General

File to restore: C:\Documents and Settings\HOSTUSER\Desktop\New Project

Name of the backup file that should be restored.

Backup Type: SQL Files

Type of backup file.

Target Schema:

● Original schema

○ Another schema information_schema

Options

□ Ignore Errors

□ Create database(s) if they don't exist

Character Set

File Charset: utf8

If you are importing a SQL file that has not been created with MySQL Administrator, you have to choose the correct character set of the file. If you have created the backup with MySQL Administrator the file was written in UTF-8.

3. now the schema is created in the mysql…..
Now strat the coding in netbeans…

SERVER SIDE:

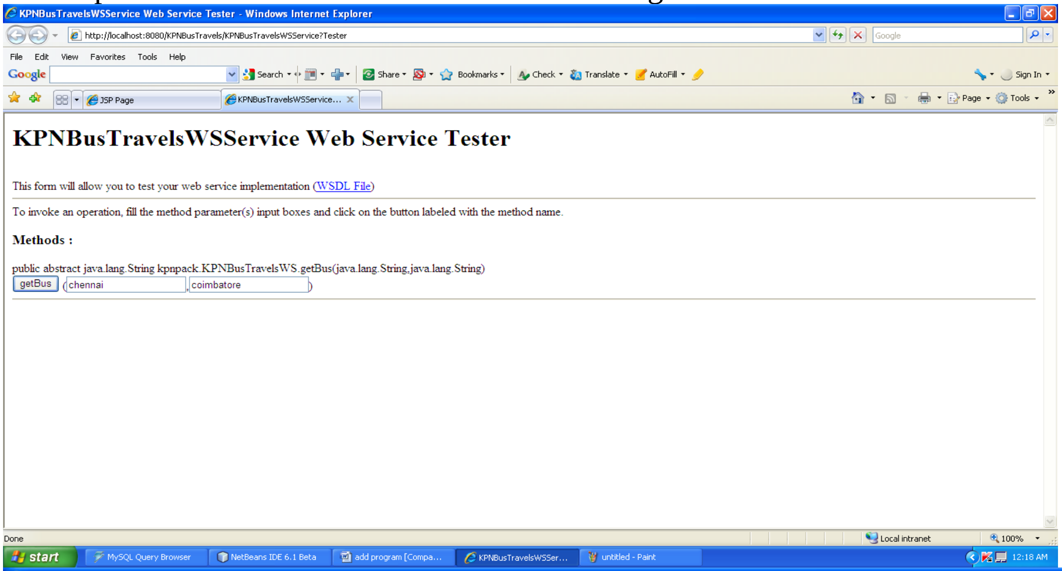
1.create the server project as before and with the following changes.
Project name: KPNBusTravels

2.web service name:KPNBusTravels
Package name:kpnpack
3.in design window
Operation name:getBus
Parameters:
Source and destination with the type as String.
4.Add the following code in source

```
package kpnpack;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;
import java.util.ArrayList;
import java.util.Hashtable;
import javax.jws.WebMethod;
import javax.jws.WebParam;
import javax.jws.WebService;
/**
 *
 * @author user
 */
@WebService()
public class KPNBusTravelsWS {
    /**
     * Web service operation
     */
    @WebMethod(operationName = "getBus")
    public String getBus(@WebParam(name = "source")
    String source, @WebParam(name = "destination")
    String destination) {
        //TODO write your implementation code here:
        ArrayList<String> service_name = new ArrayList<String>();
        ArrayList<String> departure_time = new ArrayList<String>();
        ArrayList<String> arrival_time = new ArrayList<String>();
       ArrayList<String> bus_fare = new ArrayList<String>();
      ArrayList<String> bus_type = new ArrayList<String>();
      ArrayList<String> bus_category=new ArrayList<String>();
       try {
       Class.forName("com.mysql.jdbc.Driver");
       Connection
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/qos","root","root");
              Statement st1=con1.createStatement();
                st1.executeUpdate("insert into qostable(webname,
exetime,price,compute,availtime) values('"+wn+"','"+et+"','"+pr+"','"+ct+"','"+at+"')");
        Statement st=con.createStatement();
            ResultSet rs = st.executeQuery(sql);
              int i=0;
            while (rs.next()) {
              departure_time.add(rs.getString(3));
              arrival_time.add(rs.getString(4));
              bus_fare.add(rs.getString(5));
               bus_type.add(rs.getString(9));
```

```
                bus_category.add(rs.getString(11));
                service_name.add(rs.getString(12));
              //  service_name.add(rs.getString("Servicename"));
              }
          } catch ( Exception e) {
             e.printStackTrace();
         }
         String concatBus =
service_name.toString()+"&"+departure_time.toString()+"&"+arrival_time.toString()
+"&"+bus_fare.toString() +"&"+
                bus_type.toString() +"&"+bus_category.toString() +",";
         return concatBus;
    }
}
```

5.Then deploy the service and test the web service as before.
Give input as Chennai and Coimbatore .then click getbus.



KPNBusTravelsWSService Web Service Tester - Windows Internet Explorer
http://localhost:8080/KPNBusTravels/KPNBusTravelsWSService?Tester
JSP Page
KPNBusTravelsWSService...
Done
Local intranet
100%
start
MySQL Query Browser
NetBeans IDE 6.1 Beta
add program [Compa...
KPNBusTravelsWSSer...
untitled - Paint
12:18 AM

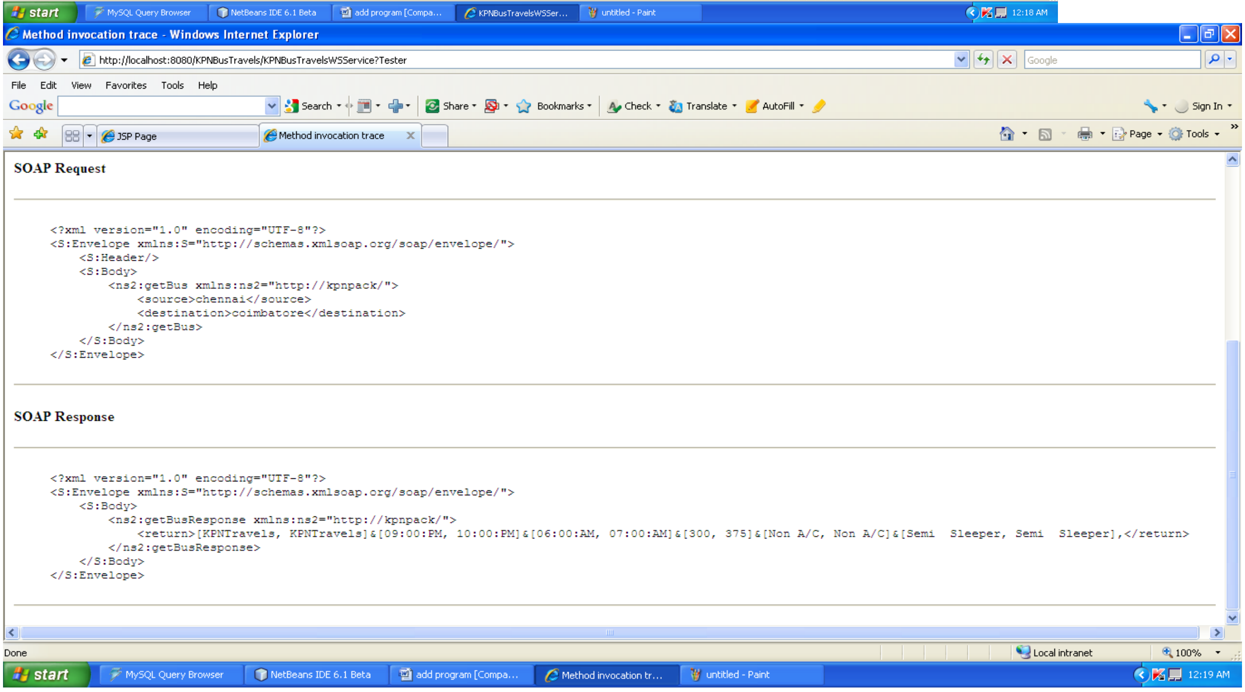
KPNBusTravelsWSService Web Service Tester

This form will allow you to test your web service implementation (WSDL File)

To invoke an operation, fill the method parameter(s) input boxes and click on the button labeled with the method name.

Methods :

public abstract java.lang.String kpnpack.KPNBusTravelsWS.getBus(java.lang.String,java.lang.String)
getBus (chennai , coimbatore)



SOAP Request

```
<?xml version="1.0" encoding="UTF-8"?>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
    <S:Header/>
    <S:Body>
        <ns2:getBus xmlns:ns2="http://kpnpack/">
            <source>chennai</source>
            <destination>coimbatore</destination>
        </ns2:getBus>
    </S:Body>
</S:Envelope>
```

SOAP Response

```
<?xml version="1.0" encoding="UTF-8"?>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
    <S:Body>
        <ns2:getBusResponse xmlns:ns2="http://kpnpack/">
            <return>[KPNTravels, KPNTravels]&[09:00:PM, 10:00:PM]&[06:00:AM, 07:00:AM]&[300, 375]&[Non A/C, Non A/C]&[Semi  Sleeper, Semi  Sleeper],</return>
        </ns2:getBusResponse>
    </S:Body>
</S:Envelope>
```

CLIENT SIDE:

1. Create new project

Name:client1

2. As before in addition program create web service reference.
3. The source code for index.jsp and action,jsp are as follow.

Index.jsp:

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
   "http://www.w3.org/TR/html4/loose.dtd">
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h2>Hello World!</h2>
        <form name="" action="actionn.jsp" method="post">
 Enter Source:<input  name="source" type="text" /><br/>
Enter Destination:<input  name="destination" type="text" /><br/>
 <input  name="ok" type="submit" value="" />
</form>
    </body>
</html>
```

Action.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
   "http://www.w3.org/TR/html4/loose.dtd">
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h2>Hello World!</h2>
         <%
 String a1=request.getParameter("source");
  String b1=request.getParameter("destination");
  %>
    <%-- start web service invocation --%><hr/>
    <%-- end web service invocation --%><hr/>
    <%-- start web service invocation --%><hr/>
    <%
        String[] res,commasplit=null,lbrsplit=null,rbrsplit=null;
       String[][] flight_trans=new String[100][100];
        int row=0,col=0;
        int trow=0,tcol=0;
        int midrow=0,midcol=0;
        // Jagson
       String[] jagres,jagcommasplit=null,jaglbrsplit=null,jagrbrsplit=null;
       String[][] jagflight_trans=new String[100][100];
        int jagrow=0,jagcol=0;
        //Air India
        String[] airres,aircommasplit=null;
       String[][] airflight_trans=new String[100][100];
```

```
        int airrow=0,aircol=0;
       try {
           kpnpack.KPNBusTravelsWSService service = new
kpnpack.KPNBusTravelsWSService();
           kpnpack.KPNBusTravelsWS port = service.getKPNBusTravelsWSPort();
            // TODO initialize WS operation arguments here
           java.lang.String source = "a1";
           java.lang.String destination = "b1";
           // TODO process result here
           java.lang.String result = port.getBus(source, destination);
           out.println("Result = "+result);
           res=result.split("&");
        System.out.println("Jet Split:"+res);
           for(int i=0;i<res.length;i++)
           {
              int j=0;
           row=res.length;
           String lbr=res[i].replace("[", "");
           String rbr=lbr.replace("]", "");
           commasplit=rbr.split(",");
           for( j=0;j<commasplit.length;j++)
               {
               col=commasplit.length;
               System.out.println("flight_trans[i][j]"+i+"/"+j);
                if(commasplit[j]!=null)
               flight_trans[j][i]=commasplit[j];
                }
          // if( flight_trans[i][j]==null)
             // col=0;
           }
           // out.println("Res = "+res[0]);
          System.out.println("TR");
          System.out.println("jetRow:"+row);
           System.out.println("jetColumn:"+col);
         for(int r=0;r<row;r++)
            {
            for(int c=0;c<col;c++)
                {
                if(flight_trans[r][c]!=null)
                System.out.print("tr:"+flight_trans[r][c]);
            }
            System.out.println();
         }

    } catch (Exception ex) {
           // TODO handle custom exceptions here
    }
    %>
    <%-- end web service invocation --%><hr/>
    </body>
</html>
```

4.Then finally undeploy and deploy the client and run it……………..

VIVA QUESTIONS(PRELAB & POSTLAB)

1. Define Web Service.
2. Give an example of real web service.
3. Define SOAP.
4. Define WSDL.
5. What does UDDI means?
6. What are the advantages of Web Services?
7. Compare SOAP and REST web services
8. What are different ways to test web services?
9. What is difference between SOA and Web Services?
10. What is JAX-WS API?

RESULT

Thus the web service for travel services had been created.

Ex No: 11

DEVELOPMENT OF WEB APPLICATION OF ANGULARJS

AIM

To develop a web application using AngularJS framework.

SOFTWARE REQUIRED

AngularJS Library, Editor/IDE, Browser and Web server

DESCRIPTION

AngularJS is a client side JavaScript MVC framework to develop a dynamic web application. AngularJS was originally started as a project in Google but now, it is open source framework.

AngularJS Extends HTML

- AngularJS extends HTML with ng-directives.
- The ng-app directive defines an AngularJS application.
- The ng-model directive binds the value of HTML controls (input, select, textarea) to application data.
- The ng-bind directive binds application data to the HTML view.

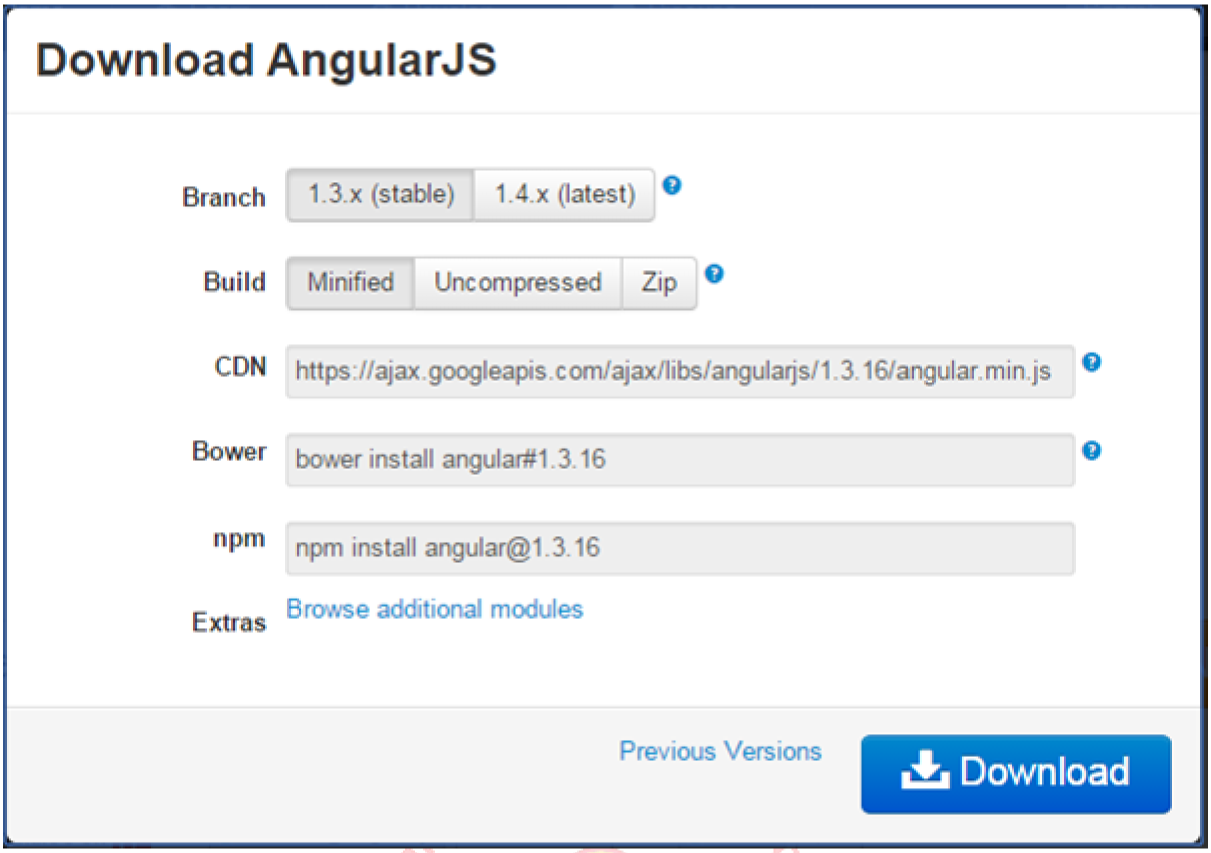
SETUP ANGULARJS DEVELOPMENT ENVIRONMENT

We need the following tools to setup a development environment for AngularJS:

1. AngularJS Library
2. Editor/IDE
3. Browser
4. Web server

AngularJS Library

To download AngularJS library, go to angularjs.org -> click download button, which will open the following popup.



Download AngularJS

Branch: 1.3.x (stable) | 1.4.x (latest)

Build: Minified | Uncompressed | Zip

CDN: https://ajax.googleapis.com/ajax/libs/angularjs/1.3.16/angular.min.js

Bower: bower install angular#1.3.16

npm: npm install angular@1.3.16

Extras: Browse additional modules

Download AngularJS Library

Select the required version from the popup and click on download button in the popup.

CDN: You can include AngularJS library from CDN url – https://ajax.googleapis.com/ajax/libs/angularjs/1.3.16/angular.min.js

Editor

AngularJS is eventually HTML and JavaScript code. So you can install any good editor/IDE as per your choice.

The following editors are recommended:

- Sublime Text
- Aptana Studio 3
- Ultra Edit
- Eclipse
- Visual Studio

Online Editor

You can also use the following online editors for learning purpose.

- plnkr.co
- jsbin.com

We are using our own online code editor for all the AngularJS examples in these tutorials.

Web server

Use any web server such as IIS, apache etc., locally for development purpose.

Browser

You can install any browser of your choice as AngularJS supports cross-browser compatibility. However, it is recommended to use Google Chrome while developing an application.

Angular Seed

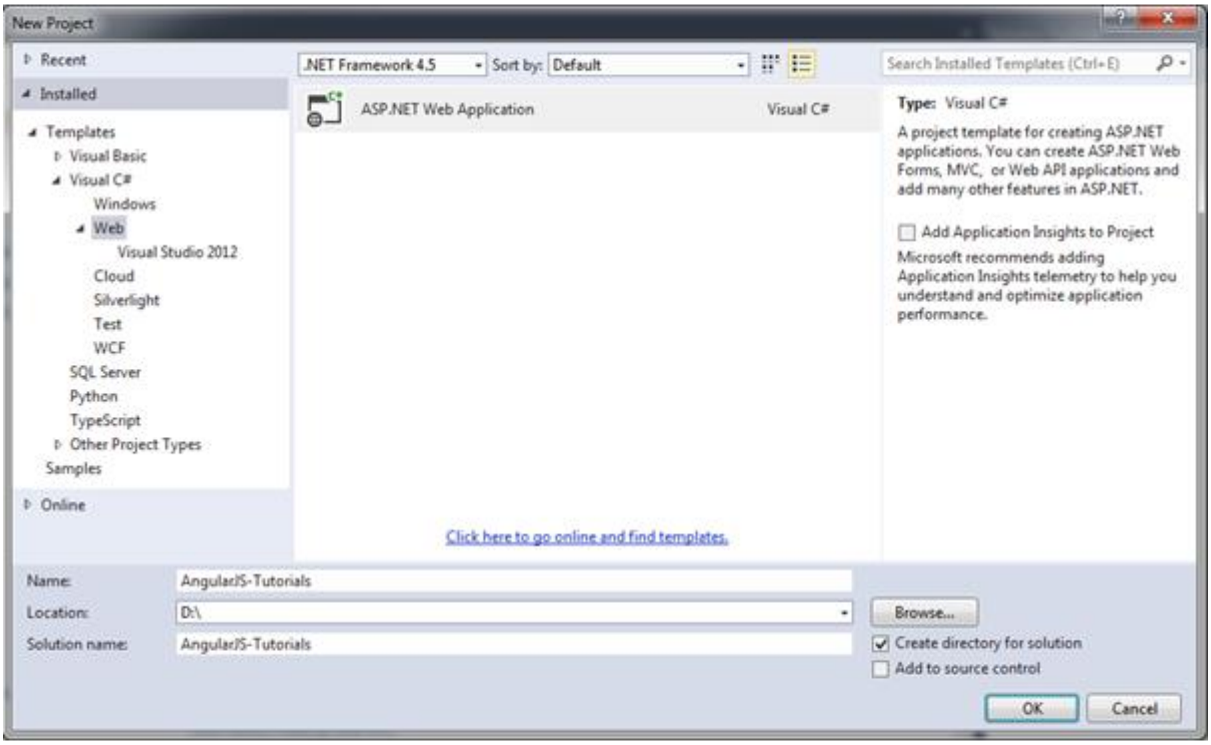
Use Angular seed project to quickly get started on AngularJS application. The Angular-seed is an application skeleton for a typical AngularJS web application. You can use it to quickly bootstrap your angular webapp projects and development environment for your project.

Let's setup Angular project in Visual Studio 2013 for web.

Setup AngularJS Project in Visual Studio

You can create AngularJS application in any version of Visual Studio. Here, we will use Visual Studio 2013 for web.

First, create new project by clicking on New Project link on start page. This will open New Project dialog box, as shown below.



Type: Visual C#

A project template for creating ASP.NET applications. You can create ASP.NET Web Forms, MVC, or Web API applications and add many other features in ASP.NET.

□ Add Application Insights to Project

Microsoft recommends adding Application Insights telemetry to help you understand and optimize application performance.

Name: AngularJS-Tutorials

Location: D:\

Solution name: AngularJS-Tutorials

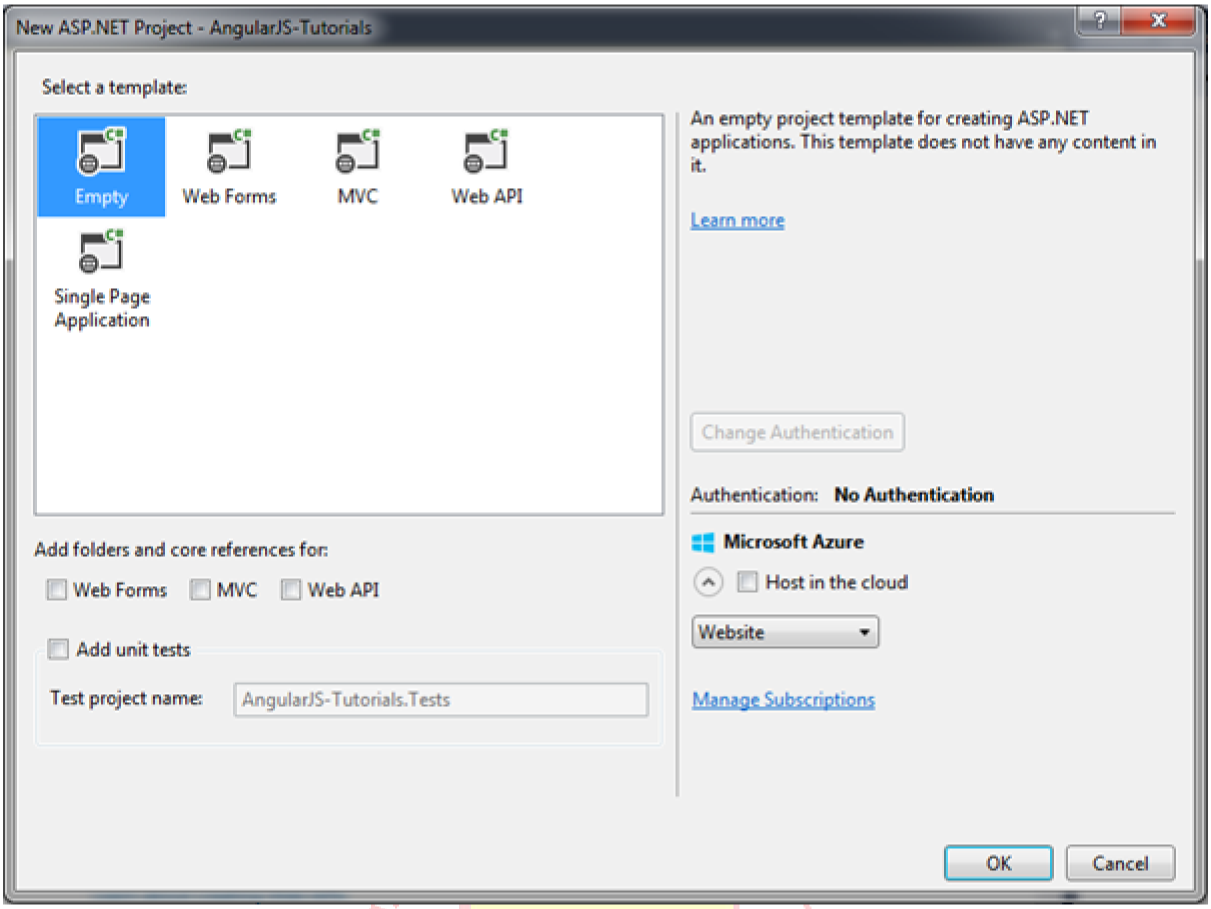
☑ Create directory for solution

□ Add to source control

AngularJS in Visual Studio

Select Web in the left pane and ASP.NET Web Application in the middle pane and then click OK.

In the New ASP.NET Project dialog box, select Empty template and then click OK.



New ASP.NET Project - AngularJS-Tutorials

Select a template:

An empty project template for creating ASP.NET applications. This template does not have any content in it.

Authentication: No Authentication

Add folders and core references for:

□ Web Forms □ MVC □ Web API

□ Add unit tests

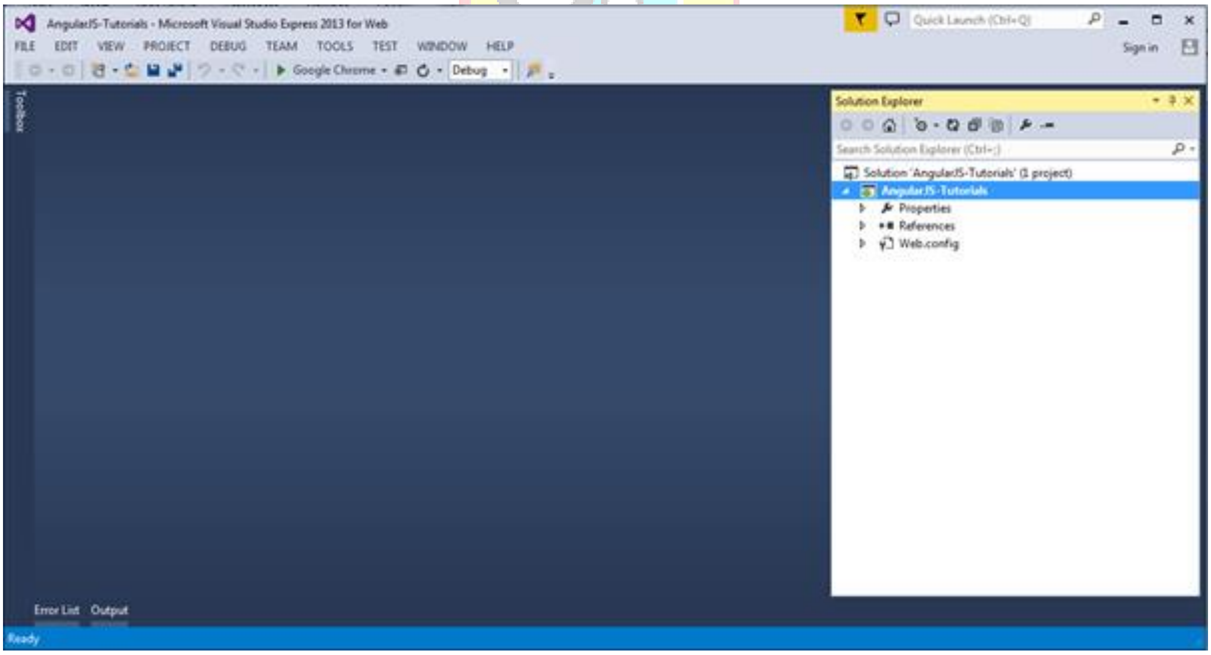
Test project name: AngularJS-Tutorials.Tests

□ Host in the cloud

Website

AngularJS in Visual Studio

This will create an empty website project in Visual Studio.



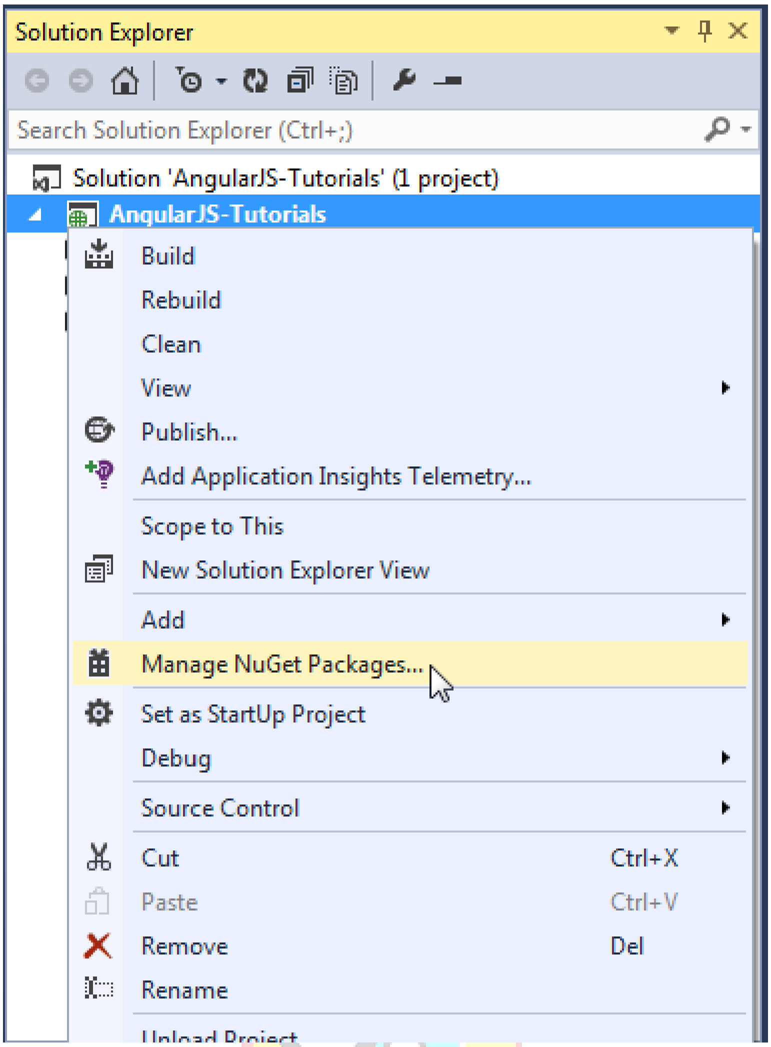
AngularJS-Tutorials - Microsoft Visual Studio Express 2013 for Web

FILE EDIT VIEW PROJECT DEBUG TEAM TOOLS TEST WINDOW HELP
Quick Launch (Ctrl+Q)
Sign in
Google Chrome
Debug
Toolbox
Solution Explorer
Search Solution Explorer (Ctrl+;)

Solution 'AngularJS-Tutorials' (1 project)
- AngularJS-Tutorials
  - Properties
  - References
  - Web.config

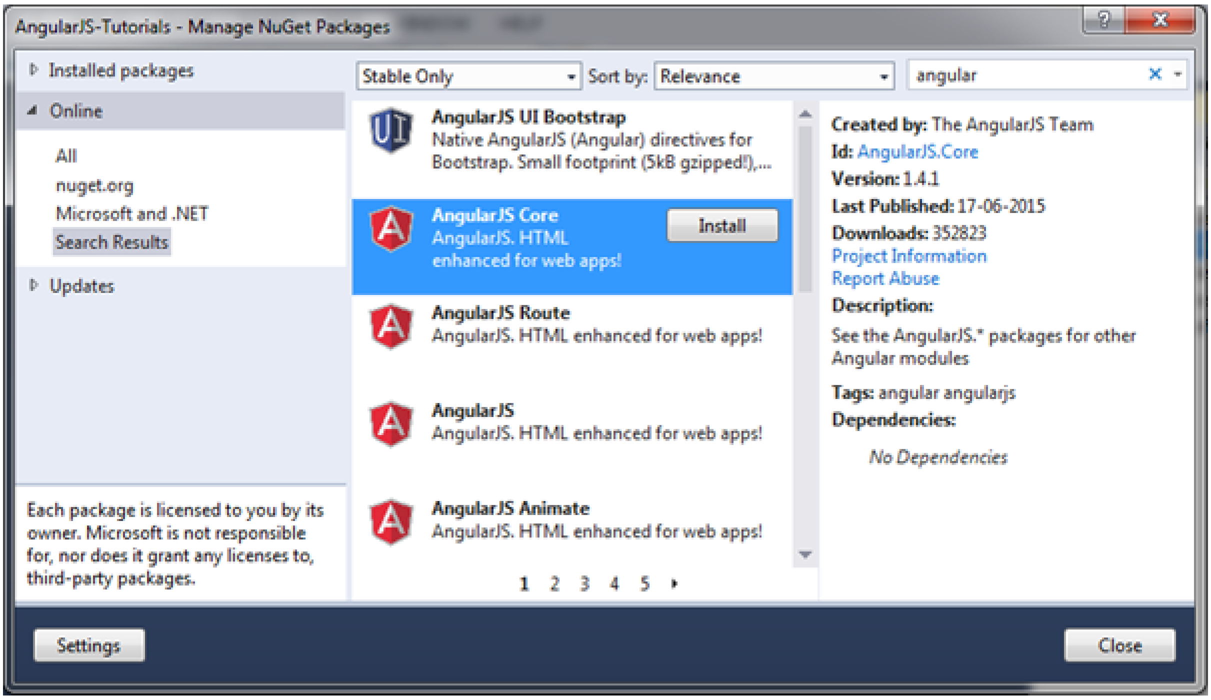
AngularJS in Visual Studio

Now, install AngularJS library from NuGet package manager. Right click on the project in Solution Explorer and select Manage NuGet Packages..



AngularJS in Visual Studio

Search for "angular" in the Manage NuGet Packages dialog box and install AngularJS Core.



AngularJS UI Bootstrap
Native AngularJS (Angular) directives for Bootstrap. Small footprint (5kB gzipped!),...

AngularJS Core
AngularJS. HTML enhanced for web apps!

AngularJS Route
AngularJS. HTML enhanced for web apps!

AngularJS
AngularJS. HTML enhanced for web apps!

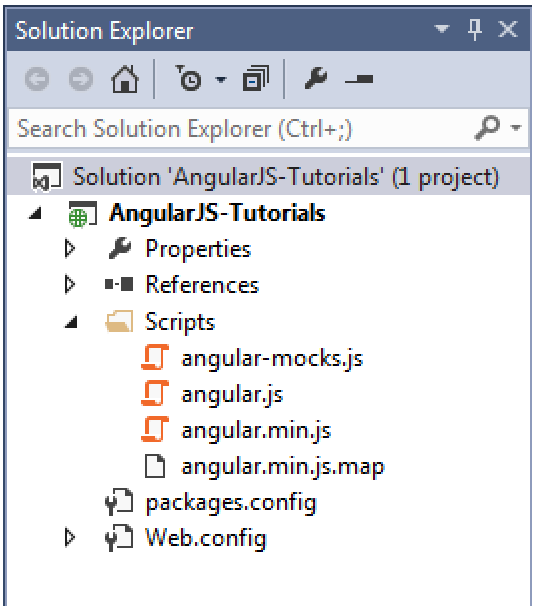
AngularJS Animate
AngularJS. HTML enhanced for web apps!

Created by: The AngularJS Team
Id: AngularJS.Core
Version: 1.4.1
Last Published: 17-06-2015
Downloads: 352823
Project Information
Report Abuse
Description:
See the AngularJS.* packages for other Angular modules
Tags: angular angularjs
Dependencies:
No Dependencies

Each package is licensed to you by its owner. Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.

AngularJS in Visual Studio

This will add AngularJS files into Scripts folder such as angular.js, angular.min.js, and angular-mocks.js, as shown below.



```
Solution 'AngularJS-Tutorials' (1 project)
◢ AngularJS-Tutorials
    ▷ Properties
    ▷ References
    ◢ Scripts
        angular-mocks.js
        angular.js
        angular.min.js
        angular.min.js.map
      packages.config
    ▷ Web.config
```

AngularJS in Visual Studio

CODE

Let's create a simple AngularJS web application step by step and understand the basic building blocks of AngularJS.

1. First, create an HTML document with <head> and <body> elements, as show below.

Example: HTML Template

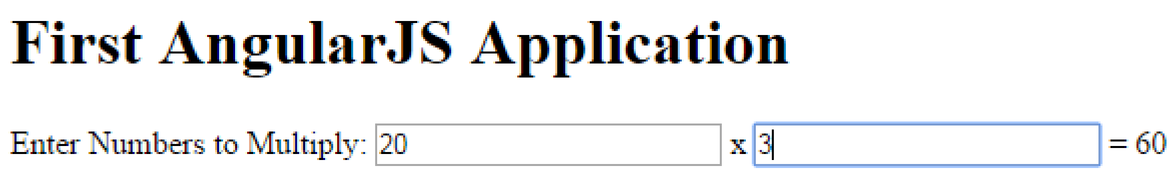
```
<!DOCTYPE html>
<html>
   <head>
   </head>
<body>
  </body>
</html>
```

2. Include angular.js file in the head section (you have learned how to download angular library in the previous section). You can take a reference from the CDN also. (all the examples in this tutorials will use CDN reference.)

Example: Include AngularJS Library

```
<!DOCTYPE html>
<html>
<head>
   <title>First AngularJS Application</title>
   <script src= "~/Scripts/angular.js"></script>
</head>
<body>
  </body>
</html>
```

3. Here, we will be creating a simple multiplier application which will multiply two numbers and display the result. User will enter two numbers in two separate textboxes and the result will be displayed immediately, as shown below.



First AngularJS Application

Enter Numbers to Multiply: 20 x 3 = 60

First AngularJS Application

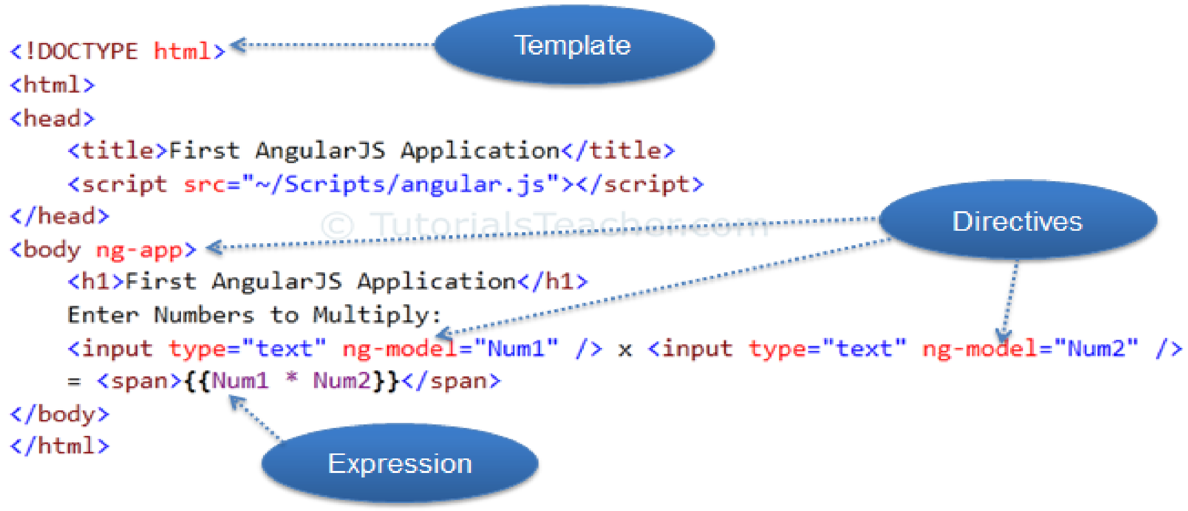
The following is the HTML code with AngularJS for the above multiplier example.

Example: First AngularJS Application

```
<!DOCTYPE html>

<html>
<head>
   <title>First AngularJS Application</title>
   <script src= "~/Scripts/angular.js"></script>
</head>
<body ng-app >
   <h1>First AngularJS Application</h1>

   Enter Numbers to Multiply:
   <input type="text" ng-model="Num1" /> x <input type="text" ng-model="Num2" />
   = <span>{{Num1 * Num2}}</span>
</body>
</html>
```

The above example is looks like HTML code with some strange attributes and braces such as ng-app, ng-model, and {{ }}. These built-in attributes in AngularJS are called directives.

The following figure illustrates the AngularJS building blocks in the above example.



```
<!DOCTYPE html>
<html>
<head>
    <title>First AngularJS Application</title>
    <script src="~/Scripts/angular.js"></script>
</head>
<body ng-app>
    <h1>First AngularJS Application</h1>
    Enter Numbers to Multiply:
    <input type="text" ng-model="Num1" /> x <input type="text" ng-model="Num2" />
    = <span>{{Num1 * Num2}}</span>
</body>
</html>
```

First AngularJS Application

Template

In AngularJS, a template is HTML with additional markups. AngularJS compiles templates and renders the resultant HTML.

Directive

Directives are markers (attributes) on a DOM element that tell AngularJS to attach a specific behavior to that DOM element or even transform the DOM element and its children.

Most of the directives in AngularJS are starting with **ng**. It stands for Angular. We have applied ng-app and ng-model directive in the above example.

ng-app: The ng-app directive is a starting point. If AngularJS framework finds ng-app directive anywhere in the HTML document then it bootstraps (initializes) itself and compiles the HTML template.

ng-model: The ng-model directive binds HTML element to a property on the $scope object. You will learn about this model later but for now let us consider this as a model property.

In the above example, we have included ng-model directive to both the textboxes with different names Num1 and Num2. AngularJS framework will create two properties called Num1 and Num2 in the scope and will assign a value that we type into textboxes.

Expression

An expression is like JavaScript code which is usually wrapped inside double curly braces such as {{ expression }}. AngularJS framework evaluates the expression and produces a result. In the above example, {{ Num1 * Num2}} will simply display the product of Num1 and Num2.

The following table lists all the important concepts in AngularJS.

Concept	Description
Template	HTML with additional markup
Directives	Extends the HTML with custom attributes and elements

Concept	Description
Model	The data shown to the user in the view and with which the user interacts
Scope	A context where the model is stored so that controllers, directives and expressions can access it
Expressions	Executes JavaScript code inside brackets {{ }}.
Compiler	Parses the template and instantiates directives and expressions
Filter	Formats the value of an expression for display to the user
View	what the user sees (the DOM)
Data Binding	Sync data between the model and the view
Controller	Maintains the application data and business logic
Module	a container for different parts of an app including controllers, services, filters, directives which configure the Injector
Service	Reusable business logic, independent of views
Dependency Injection	Creates and wires objects and functions
Injector	Dependency injection container

VIVA QUESTIONS (PRELAB & POSTLAB)

1. What is AngularJS?
2. What are the key features of AngularJS?
3. Explain services in AngularJS.
4. What is Angular Expression? Explain the key difference between angular expressions and JavaScript expressions.
5. What are directives? Name some of the most commonly used directives in AngularJS application.
6. What are the benefits of AngularJS?
7. Explain directives and their types.
8. Explain injector in AngularJS.
9. What is the main difference between a link and compile in Angular.js?
10. How can you integrate AngularJS with HTML?

RESULT

Thus a web application had been created using Angular framework.