Aim : Develop web applications using JSP and JSTL.

Theory :

JSP :

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc.

A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development. It provides some additional features such as Expression Language, Custom Tags, etc

The scripting elements provides the ability to insert java code inside the jsp. There are three types of scripting elements:

- scriptlet tag

- expression tag

- declaration tag

Scriplet Tag : A scriptlet tag is used to execute java source code in JSP. Syntax is as follows:

<% java source code %>

Expression Tag : The code placed within JSP expression tag is written to the output stream of the response. So you need not write out.print() to write data. It is mainly used to print the values of variable or method.

Syntax of JSP expression tag
<%= statement %>

Declaration Tag : The JSP declaration tag is used to declare fields and methods.
The code written inside the jsp declaration tag is placed outside the service() method of auto generated servlet.
So it doesn't get memory at each request.
Syntax :
<%! field or method declaration %>

UseBean tag :

The jsp:useBean action tag is used to locate or instantiate a bean class. If bean object of the Bean class is already created, it doesn't create the bean depending on the scope. But if object of bean is not created, it instantiates the bean.

Syntax of jsp:useBean action tag
<jsp:useBean id= "instanceName" scope= "page | request | session | application"
class= "packageName.className" type= "packageName.className"
beanName="packageName.className | <%= expression >" >
</jsp:useBean>

Taglib Tag :

The JSP taglib directive is used to define a tag library that defines many tags. We use the TLD (Tag Library Descriptor) file to define the tags. In the custom tag section we will use this tag so it will be better to learn it in custom tag.

Syntax JSP Taglib directive
<%@ taglib uri="uriofthetaglibrary" prefix="prefixoftaglibrary" %>
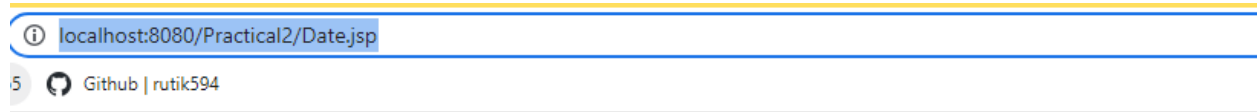
Code :

Q.1. Create a JSP page to display current date and time.

Code:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
  pageEncoding="ISO-8859-1"%>
  <%@ page import = "java.io.*,java.util.*, jakarta.servlet.*" %>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
 <body>
   <center>
     <h1>Display Current Date & Time</h1>
   </center>
   <%
     Date date = new Date();
```

```
    out.print( "<h2 align = \"center\">" +date.toString()+"</h2>");
  %>
 </body>
</html>
```

O/P :

2. Create a menu driven JSP page that will take input from the user sides and display area of a shape.
NOTE: Shape can be triangle or circle input is to taken from user.
Code :

Index.jsp :

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%
String name=request.getParameter("shape");
if(name!=null){
        response.sendRedirect(name+".jsp");
}
%>
```

```
<%= name %>
<form action="index.jsp">
Triangle :<input type="radio" name="shape" value="Triangle">
Circle: <input type="radio" name="shape" value="Circle">
<button type="submit">Submit</button>
</form>
</body>
</html>
```

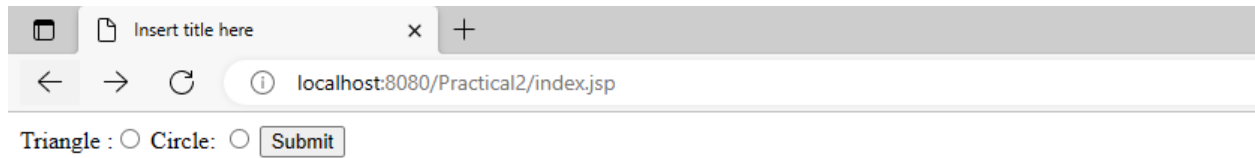**Circle.jsp :**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<form action="Circle.jsp">
<h1>Circle Area :</h1>
<input type="number" name="radius" placeholder="Enter radius">
<button type="submit">Submit</button>
</form>
<%
            String radius=request.getParameter("radius");
if(radius!=null){
      int r=Integer.parseInt(radius);
      String ans=String.format("Area of circle with radius %d is %f ",r,3.14*r*r);
      out.println(ans);
}
%>
</body>
</html>
```

Triangle.jsp :

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
```

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<form action="Triangle.jsp">
<h1>Triangle Area :</h1>
<input type="number" name="base" placeholder="Enter base">
<input type="number" name="height" placeholder="Enter height">
<button type="submit">Submit</button>
</form>
<%
String base=request.getParameter("base");
String height=request.getParameter("height");
if (height!=null && base!=null){
        int intbase=Integer.parseInt(base);
        int intheight=Integer.parseInt(height);
        double area=0.5*intbase*intheight;
        out.println("Area of triangle is "+area);
}
%>
</body>
</html>
```
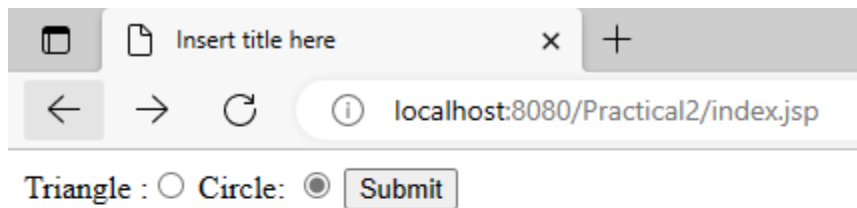
O/P :

Selecting Circle :

Insert title here   ×   +

← C ⓘ localhost:8080/Practical2/Circle.jsp

Circle Area :

3 ⬦ | Submit |

Insert title here   ×   +

← C ⓘ localhost:8080/Practical2/Circle.jsp?radius=3

Circle Area :

| Enter radius | | Submit |
Area of circle with radius 3 is 28.260000

Selecting Triangle :

Insert title here   ×   +

localhost:8080/Practical2/index.jsp

Triangle : ⊙ Circle: ○ Submit

3. Create JSP page to demonstrate the use of scriplet, expression and declaration tag.

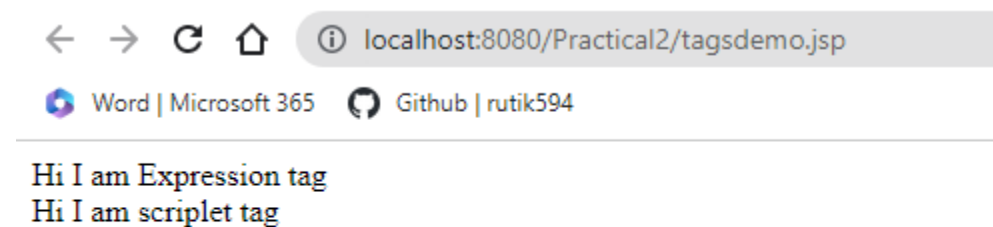Code :

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%!
       String str="Hi I am Expression tag";
%>
<%= str %><br>
<%
String str1="Hi I am scriplet tag";

%>

<%= str1 %>
</body>
</html>
```

O/P :

Hi I am Expression tag
Hi I am scriplet tag

Q.4. Create a JSP of registration form an store the same in database.

Code :

Databaseconnectivity.jsp :

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<h1>Employee Registration Form</h1>
<form action="Display.jsp">
<input type="text" name="name" placeholder="Enter your name"><br>
<input type="number" name="id" placeholder="Enter your id"><br>
<input type="number" name="age" placeholder="Enter your age"><br>
<input type="email" name="email" placeholder="Enter your email"><br>
<input type="text" name="address" placeholder="Enter your address"><br>
<input type="submit" name="submit" placeholder="Submit"><br>
</form>

</body>
</html>
```
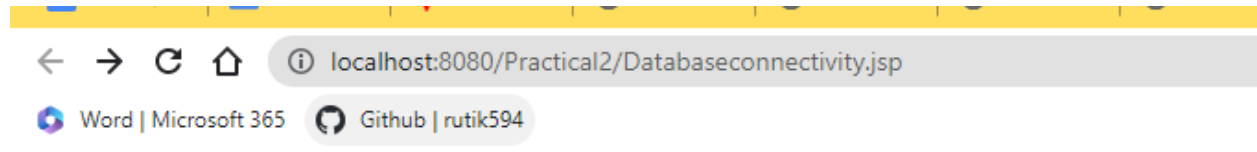
Display.jsp :

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
  <%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql" %>
<%@ taglib uri="http://java.sun.com/jsp/jstl/functions" prefix="fn" %>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%
String name=request.getParameter("name");
int id=Integer.parseInt(request.getParameter("id"));
```

```
int age=Integer.parseInt(request.getParameter("age"));
        String email=request.getParameter("email");
        String address=request.getParameter("address");
        //out.println(name);
        //out.println(id);
        //out.println(age);
        //out.println(email);
        //out.println(address);

%>

<sql:setDataSource var="db" driver="com.mysql.jdbc.Driver"
url="jdbc:mysql://localhost:3306/Employee" user="root" password="Rutikdkbha123@#" />
<sql:update dataSource="${db}" var="count">
INSERT INTO Employee_Rutik(name,id,age,email,address) VALUES (?, ?, ?, ?,?)
<sql:param value="${param.name}" />
<sql:param value="${param.id}" />
<sql:param value="${param.age}" />
<sql:param value="${param.email}" />
<sql:param value="${param.address}" />
</sql:update>
<c:out value="values inserted in Employee_Rutik Table" />
</body>
</html>
```
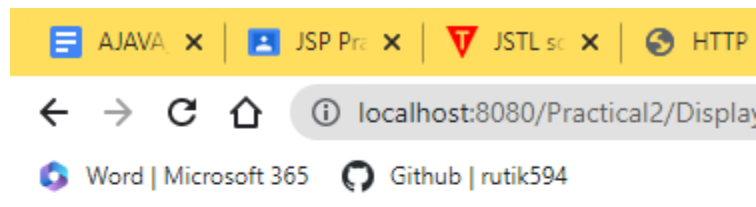
O/P :

Employee Registration Form

values inserted in Employee_Rutik Table

Record stored in Database

name	id	age	email	address
Rutik	1	22	rutikbhanushali25@gmail.com	sector-15

5. Create a JSP page to UseBean tag and taglib Tag in JSP.

Code :

Demonstrating use of useBean tag
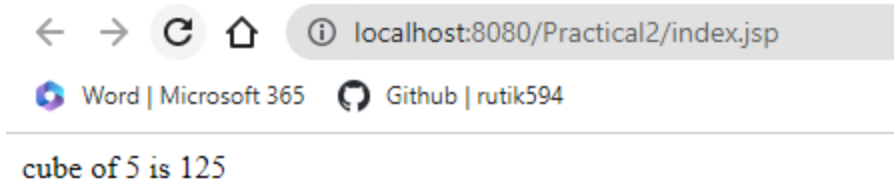
Calculator class

```
package program5;

public class Calculator {
        public int cube(int n){return n*n*n;}
}
```

Index.jsp :

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
  pageEncoding="ISO-8859-1"%>
  <jsp:useBean id="obj" class="program5.Calculator"/>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%
int m=obj.cube(5);
out.print("cube of 5 is "+m);
%>
</body>
</html>
```

O/P :

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cube of 5 is 125

Demonstrating use of taglib tag:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
   <jsp:useBean id="obj" class="program5.Calculator"/>
     <%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<jsp:useBean id="test" class="program5.Calculator"/>
Area of cube is <c:out value="${test.cube()}" />
</body>
</html>
```
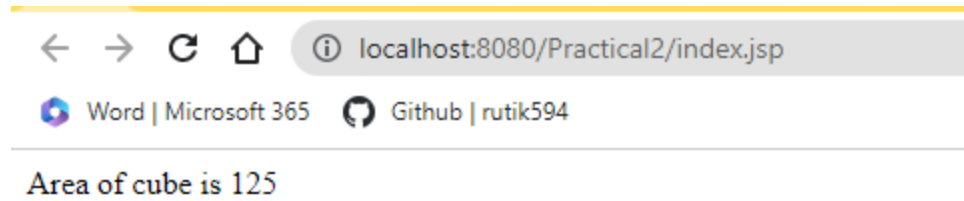
Calculator class is same as mentioned above.

O/P:

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Area of cube is 125

Conclusion : I have learned JSP and JSTL successfully..