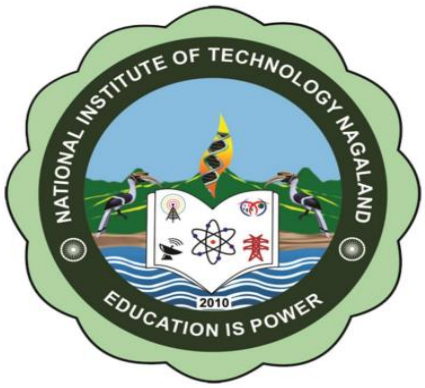

Service Oriented Architecture Laboratory (CS356)

Submitted by

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Semester :- 6th

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Service Oriented Architecture

Assignmment – 1

Aim :- To create a web service for adding few numbers using NetBeans.

Algorithm :-

1. Using the Netbeans API create a project of the type web application.
2. Create a web service in the project.
3. Click on the Design tab and design the prototype of the web service.
4. Click on source tab and modify the application logic of the web service.
5. Save the project.
6. Right click on the project and click on deploy and undeploy.
7. Then test the web service.

Code :-

Steps :-

1.OPEN File->New->NewProject->Web->Web App..click next .

2.Give Project name->addserver…then click finish

3. The add server project will be created in right side. Right click it and choose the following. Give the web service name as add web.

4.After this in left side ,the design window choose the add operation

5. Give the following in the opened window for creating operation

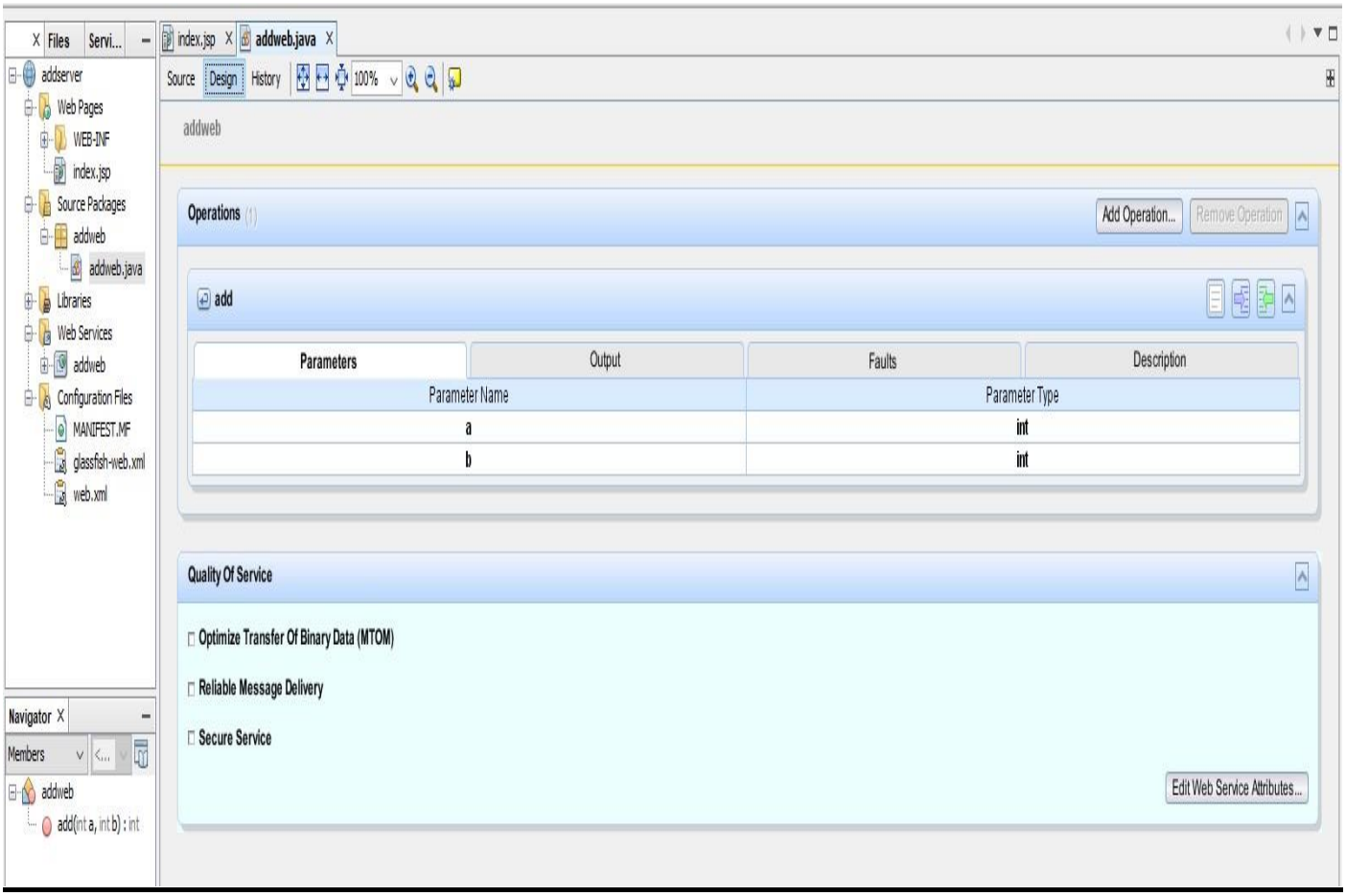
Name->add

6.Then in the source add the following code and save it.

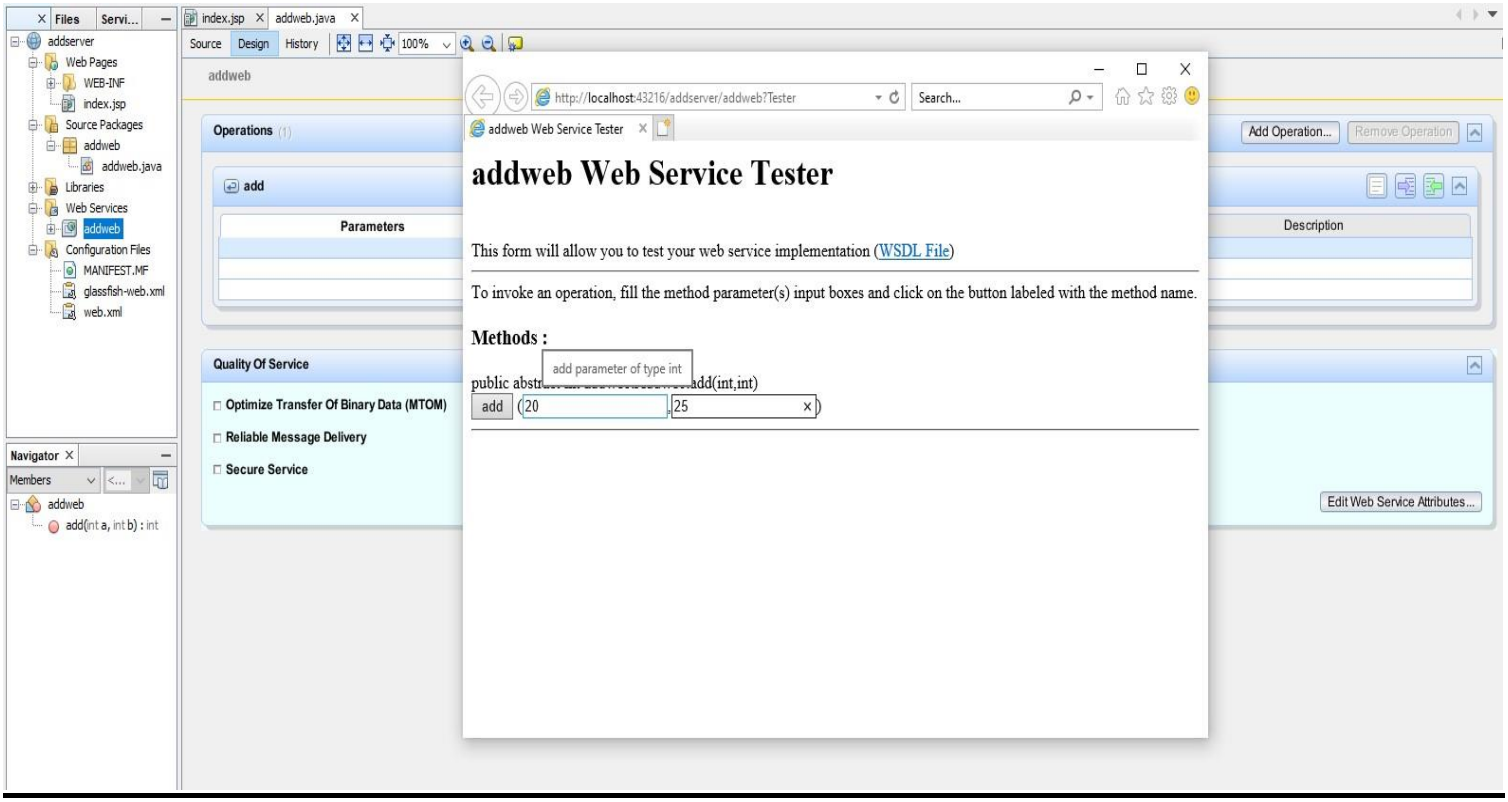
addweb.java :-

```
package addweb;


import javax.jws.WebMethod;

import javax.jws.WebParam;

import javax.jws.WebService;
```

```
/**
 *
 * @author saksham
 */
@WebService(serviceName = "addweb")
public class addweb {
    /**
     * Web service operation
     */
    @WebMethod(operationName = "add")
    public int add(@WebParam(name = "a") int a, @WebParam(name = "b") int b) {
        //TODO write your implementation code here:
        int k = a+b;
        return k;
    }
}
```



Output :-



add Method invocation

Method parameter(s)

Type	Value
int	20
int	25

Method returned

int : "**45**"

SOAP Request

```
<?xml version="1.0" encoding="UTF-8"?><S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Header/>
    <S:Body xmlns:ns2="http://addweb/">
        <ns2:add>
            <a>20</a>
            <b>25</b>
        </ns2:add>
    </S:Body>
</S:Envelope>
```

SOAP Response

```
<?xml version="1.0" encoding="UTF-8"?><S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Header/>
    <S:Body xmlns:ns2="http://addweb/">
        <ns2:addResponse>
            <return>45</return>
        </ns2:addResponse>
    </S:Body>
</S:Envelope>
```

Service Oriented Architecture

Assignmment – 2

Aim :- To create a web service for adding few numbers using NetBeans and write **client side code** to invoke the web service.

Algorithm :-

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

Code :-

Steps :-

1. Create the new project as above and give the name as addclient.

2. Addclient project will be created. right click it and choose the following.

3. Then browse and choose the addweb wsdl file

4. Then choose the following and add the source code in index.jsp and save it.

5. Then create an action.jsp as follows.

   Right click web page in addclient and choose new->jsp -> name:action -> Click finish

6. Click on the actionn.jsp page..then right click in it and choose web service client reference ->call web service

7. The invoke the add service.

8. Add code in action.jsp finally undeploy and deploy the addclient and run it.

index.jsp :-

```
<%--
    Document   : index
    Created on : Nov 5, 2021, 12:23:30 PM
    Author     : saksham
--%>

<%@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>
        <h1>Hello World!</h1>
        <form name="" action="action.jsp" method="post">
            Enter 1st No:<input name="fst" type="text" /><br/>
            Enter 2nd No:<input name="snd" type="text" /><br/>
            <input name="ok" type="submit" value="Add" />
        </form>
    </body>
</html>
```

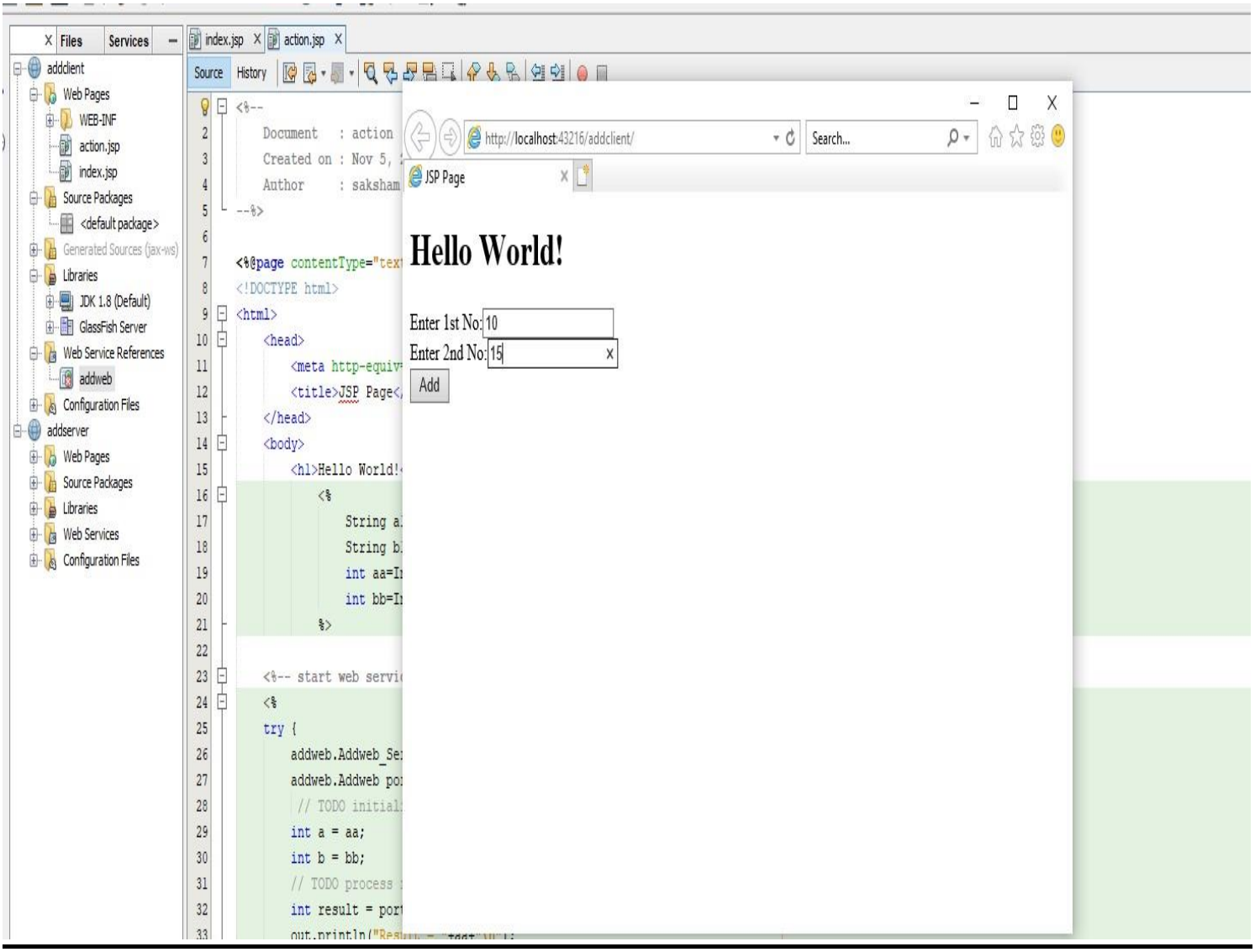
action.jsp :-

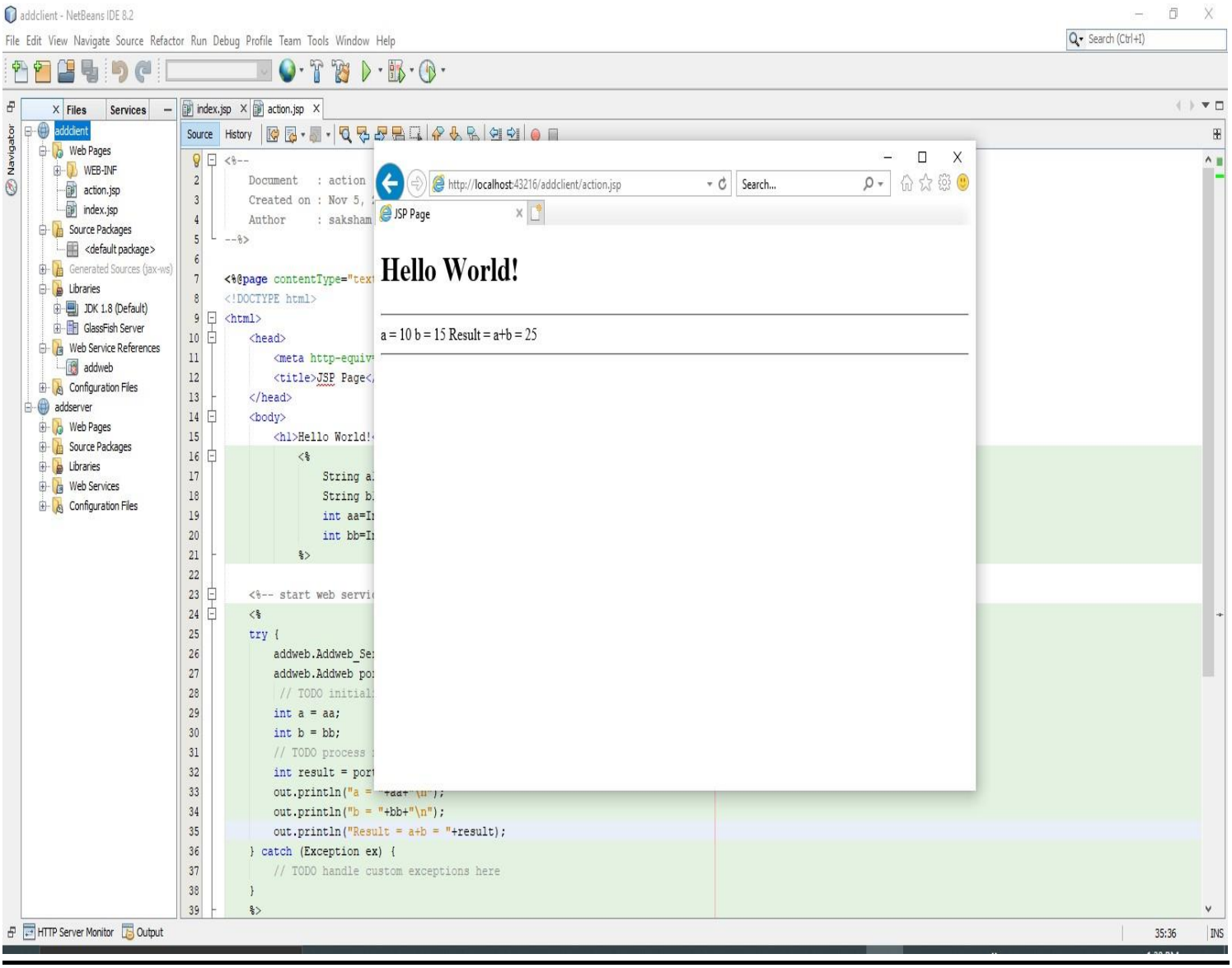
```
<%--
    Document   : action
    Created on : Nov 5, 2021, 12:33:09 PM
    Author     : saksham
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
```

```
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type"  content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h1>Hello World!</h1>
            <%
                String a1=request.getParameter("fst");
                String b1=request.getParameter("snd");
                int aa=Integer.parseInt(a1);
                int bb=Integer.parseInt(b1);
            %>

    <%-- start web service invocation --%><hr/>
    <%
    try {
                addweb.Addweb_Service  service = new addweb.Addweb_Service();
                addweb.Addweb  port = service.getAddwebPort();
                 // TODO initialize WS operation arguments here
                int a = aa;
                int b = bb;
                // TODO process result here
                int result = port.add(a, b);
        out.println("Result  = "+aa);
        out.println("Result  = "+bb);
                out.println("Result  = "+result);
    } catch (Exception ex) {
                // TODO handle custom exceptions here
```

```
    }
    %>
    <%-- end web service invocation  --%><hr/>
    </body>
</html>
```

Output :-





Service Oriented Architecture

Assignmment – 3

Aim :- **To create form in java using servlet and jsp .**

Algorithm :-

1. Using the Netbeans API create a project ‘LoginForm’ of the type web application.
2. Create a web servlet “login” in the project with package pack .
3. Modify index.jsp according to the requirements.
4. Modify the application logic of the web servlet.

5. Create new jsp “welcome.jsp” in the project as the logged in page.
6. Save the project.
7. Right click on the project and click on deploy and undeploy.
8. Then test the web service.
9. Then pass the appropriate parameters int the form entries and invoke the web service.

Code :-

index.jsp :-

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>

<!DOCTYPE html>

<html>

    <head>

        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">

        <title>Login</title>

        <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/css/bootstrap.min.css"
rel="stylesheet">

        <style>

            td{

                padding:10px;

            }

            div{

                width:50%;

                border: 1px solid black;

                background-color: lightcyan;

            }

        </style>

    </head>

    <body>

        <h1>Login Here</h1>

    <center>

        <div>
```

```
        <form action="login" method="POST">
        <table>
            <tr>
                <td>User Name</td>
                <td><input type="text" class="form-control" name="username"
placeholder="username"></td>
            </tr>
            <tr>
                <td>Password</td>
                <td><input type="text" class="form-control" name="password"
placeholder="password"></td>
            </tr>
            <tr>
                <td colspan="2" style="text-align: center"><input class="btn btn-success" type="submit"
value="submit"></td>
            </tr>
        </table>
        </form>
    </div>
  </center>
  </body>
</html>
```

welcome.jsp :-

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Welcome</title>
  </head>
  <body>
```

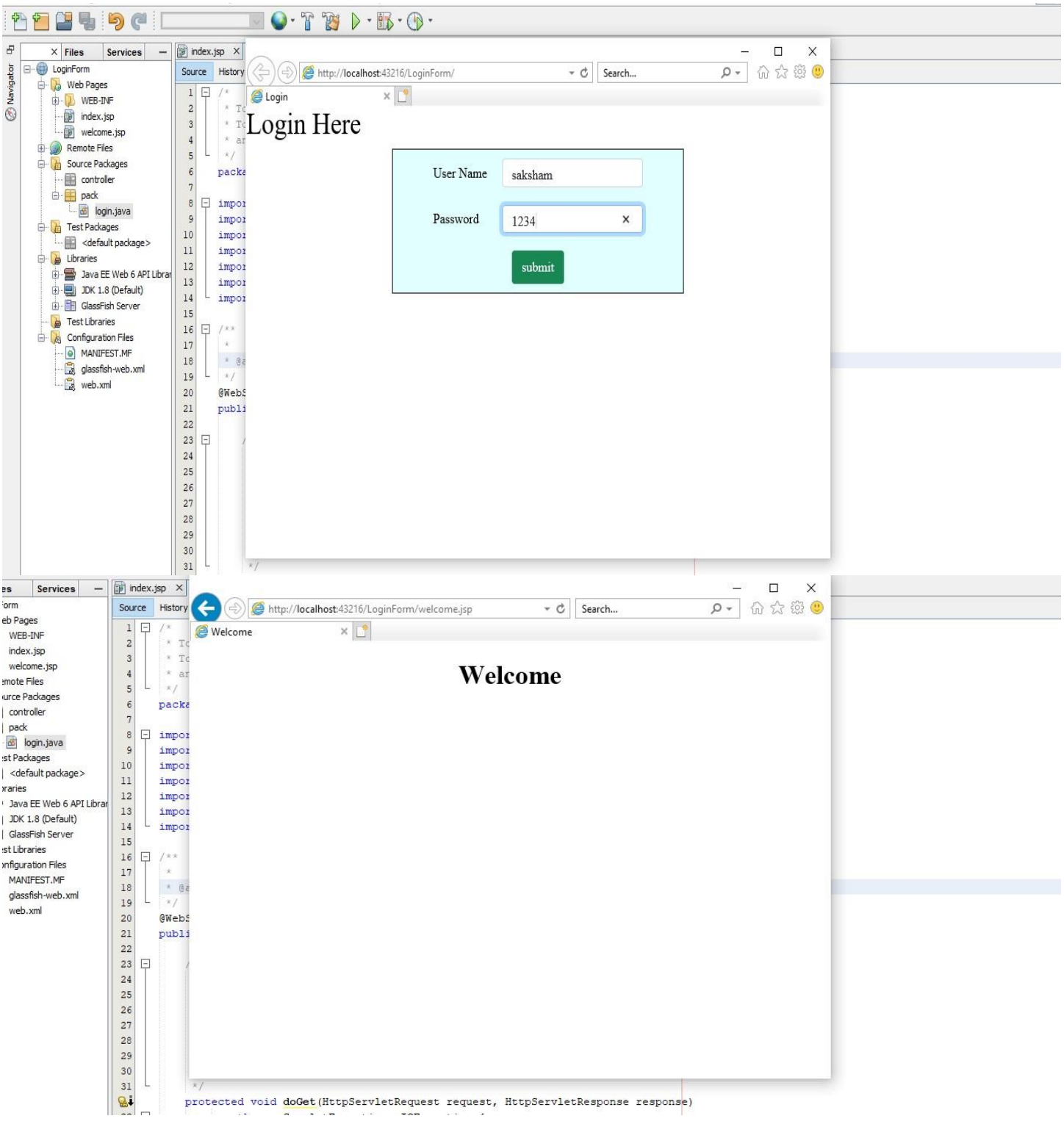
```
    <center>
        <h1>Welcome</h1>
    </center>


    </body>
</html>
```

login.java :-

```
package pack;


import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
/**
 *
 * @author saksham
 */
@WebServlet(name = "login", urlPatterns = {"/login"})
public class login extends HttpServlet {
    /**
     * Processes requests for both HTTP <code>GET</code> and <code>POST</code>
     * methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
```

```
     */
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            String _username = request.getParameter("username");
            String _password = request.getParameter("password");
            if(_username != null && _password != null)
            {
                if(_username.equals("saksham") && _password.equals("1234"))
                {
                    response.sendRedirect("welcome.jsp");
                }
                else{
                    System.out.println("Invalid user or password");
                }
            }
            else{
                System.out.println("Empty username or password");
            }
        }
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        doGet(request, response);
    }
}
```

Output :-


Files
Services
LoginForm
Web Pages
WEB-INF
index.jsp
welcome.jsp
Remote Files
Source Packages
controller
pack
login.java
Test Packages
<default package>
Libraries
Java EE Web 6 API Library
JDK 1.8 (Default)
GlassFish Server
Test Libraries
Configuration Files
MANIFEST.MF
glassfish-web.xml
web.xml
index.jsp
Source
History
http://localhost:43216/LoginForm/
Search...
Login
Login Here
User Name
saksham
Password
1234
submit
http://localhost:43216/LoginForm/welcome.jsp
Welcome
Welcome
protected void doGet(HttpServletRequest request, HttpServletResponse response)

Service Oriented Architecture

Assignmment – 4

Aim :- : Creation of Calculator in Java Netbeans .

Algorithm :-

1. Using the Netbeans API create a project 'Calculator' of the type **java application**.
2. Create a "jframe form" with class calculator and package calculations.
3. Now modify the appearance of calculator in the design section of calculator.java.
4. Modify the source code of each button according to its function.
5. Save the project.
6. Right click on the project and click on deploy and undeploy.
7. Then test the web service.
8. Then pass the appropriate parameters to get result.

Code :-

Steps :-

1. Open File->New Project->Java->Java Application->Click Next
2. Give Project name-> then Click Finish

3. The Calculator project will be created. Right click on it-> New-> JFrame Form
4. Give the Class Name and Package Name and then Click Finish

5. Now in the Palette section, Click on Text Field and drag towards Design Frame
6. Click on the Text Field Properties and Delete the Text content and Adjust Font and HorizontalAlignment as you want.

7. In the Palette section, Click on Button and drag towards the design frame
8. Go to the Button Properties (Code section) and change the Variable Name as jBtn1.

9. Go to the Properties , Delete the Text content, Enter 1 and change the font size as you want.
10. Right click on the Button 1, Click Duplicate, new button with different Variable Name will be created.

11. Create another buttons and Edit from the Properties (text) as below
12. Click the Text Field box and change the Variable Name as jtxtDisplay

13. Double click on any of the buttons, in the Source code, declare variables as follows
14. Go to the Design view, double click on the first button, enter the following lines of code as follows

15. Copy the lines of code, go to the Design, double click on button 2, paste it and change the number

And Repeat exactly for buttons 3 to 10.

16. For the Clear/Cancel (C) button, enter the lines of code as follows

17. Now for the arithmetic operators, double click on the plus button and enter the following code

18. Copy the code, go to Design, and do it for Subtraction, Division, and Multiplication by pasting the same code and change the operations respectively.
19. For the Full Stop, enter the same code used in buttons 1 to 10

20. Now, for the plus or minus (+/-) , Enter the following lines of code.
21. For the Equals (=) , enter the following lines of code as shown

22. Now, run the program.

calculators.java :-

```
package Calculations;
/**
 *
 * @author saksham
 */
public class Calculators extends javax.swing.JFrame {
    /**
     * Creates new form Calculators
     */
    double firstnum;
    double secondnum;
    double result;
    String operations;
    public Calculators() {
        initComponents();
    }
    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {
        jtxtDisplay = new javax.swing.JTextField();
```

```
jBtn1 = new javax.swing.JButton();
jBtn5 = new javax.swing.JButton();
jBtn9 = new javax.swing.JButton();
jBtn2 = new javax.swing.JButton();
jBtn6 = new javax.swing.JButton();
jBtn0 = new javax.swing.JButton();
jBtn12 = new javax.swing.JButton();
jBtn3 = new javax.swing.JButton();
jBtn7 = new javax.swing.JButton();
jBtn11 = new javax.swing.JButton();
jBtn4 = new javax.swing.JButton();
jBtn8 = new javax.swing.JButton();
jBtn13 = new javax.swing.JButton();
jBtn16 = new javax.swing.JButton();
jBtn15 = new javax.swing.JButton();
jBtn14 = new javax.swing.JButton();
jBtn17 = new javax.swing.JButton();
jBtn18 = new javax.swing.JButton();
setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
jtxtDisplay.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jtxtDisplayActionPerformed(evt);
    }
});
jBtn1.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn1.setText("1");
jBtn1.setToolTipText("");
jBtn1.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn1ActionPerformed(evt);
    }
});
jBtn5.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn5.setText("5");
```

```
jBtn5.setToolTipText("");
jBtn5.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn5ActionPerformed(evt);
    }
});
jBtn9.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn9.setText("9");
jBtn9.setToolTipText("");
jBtn9.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn9ActionPerformed(evt);
    }
});
jBtn2.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn2.setText("2");
jBtn2.setToolTipText("");
jBtn2.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn2ActionPerformed(evt);
    }
});
jBtn6.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn6.setText("6");
jBtn6.setToolTipText("");
jBtn6.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn6ActionPerformed(evt);
    }
});
jBtn0.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn0.setText("0");
jBtn0.setToolTipText("");
jBtn0.addActionListener(new java.awt.event.ActionListener() {
```

```
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn0ActionPerformed(evt);
    }
});
jBtn12.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn12.setText("-");
jBtn12.setToolTipText("");
jBtn12.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn12ActionPerformed(evt);
    }
});
jBtn3.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn3.setText("3");
jBtn3.setToolTipText("");
jBtn3.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn3ActionPerformed(evt);
    }
});
jBtn7.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn7.setText("7");
jBtn7.setToolTipText("");
jBtn7.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn7ActionPerformed(evt);
    }
});
jBtn11.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn11.setText("+");
jBtn11.setToolTipText("");
jBtn11.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn11ActionPerformed(evt);
```

```
    }
});
jBtn4.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn4.setText("4");
jBtn4.setToolTipText("");
jBtn4.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn4ActionPerformed(evt);
    }
});
jBtn8.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn8.setText("8");
jBtn8.setToolTipText("");
jBtn8.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn8ActionPerformed(evt);
    }
});
jBtn13.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn13.setText("*");
jBtn13.setToolTipText("");
jBtn13.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn13ActionPerformed(evt);
    }
});
jBtn16.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn16.setText(".");
jBtn16.setToolTipText("");
jBtn16.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn16ActionPerformed(evt);
    }
});
```

```
jBtn15.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn15.setText("+/-");
jBtn15.setToolTipText("");
jBtn15.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn15ActionPerformed(evt);
    }
});
jBtn14.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn14.setText("/");
jBtn14.setToolTipText("");
jBtn14.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn14ActionPerformed(evt);
    }
});
jBtn17.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn17.setText("c");
jBtn17.setToolTipText("");
jBtn17.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn17ActionPerformed(evt);
    }
});
jBtn18.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
jBtn18.setText("=");
jBtn18.setToolTipText("");
jBtn18.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jBtn18ActionPerformed(evt);
    }
});
javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);
```

```
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(20, 20, 20)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jtxtDisplay)
                    .addGroup(layout.createSequentialGroup()
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jBtn1, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jBtn2, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(layout.createSequentialGroup()
                                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                                    .addComponent(jBtn5, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                    .addComponent(jBtn9, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                    .addComponent(jBtn13, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE))
                                .addGap(18, 18, 18)
                                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jBtn6, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                    .addComponent(jBtn0, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                    .addComponent(jBtn14, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                            .addComponent(jBtn17, javax.swing.GroupLayout.PREFERRED_SIZE, 124,
javax.swing.GroupLayout.PREFERRED_SIZE))
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 45, Short.MAX_VALUE)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addGroup(layout.createSequentialGroup()
                                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
```

```
                        .addComponent(jBtn7, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jBtn11, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jBtn15, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE))

                    .addGap(18, 18, 18)

                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

                        .addComponent(jBtn12, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jBtn8, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jBtn16, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)))

                .addGroup(layout.createSequentialGroup()

                    .addComponent(jBtn3, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addGap(18, 18, 18)

                    .addComponent(jBtn4, javax.swing.GroupLayout.PREFERRED_SIZE, 53,
javax.swing.GroupLayout.PREFERRED_SIZE)))

            .addComponent(jBtn18, javax.swing.GroupLayout.Alignment.TRAILING,
javax.swing.GroupLayout.PREFERRED_SIZE, 124, javax.swing.GroupLayout.PREFERRED_SIZE))))

        .addGap(20, 20, 20))

    );

    layout.setVerticalGroup(

        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addGroup(layout.createSequentialGroup()

            .addGap(30, 30, 30)

            .addComponent(jtxtDisplay, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addGap(20, 20, 20)

            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

                .addGroup(layout.createSequentialGroup()

                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

                        .addComponent(jBtn3, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jBtn4, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))

                    .addGap(18, 18, 18)
```

```
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn8, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn7, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn12, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn11, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn16, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn15, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addComponent(jBtn18, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn1, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn2, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn6, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn5, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jBtn0, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jBtn9, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
```

```
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(jBtn14, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jBtn13, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addGap(19, 19, 19)
                    .addComponent(jBtn17, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );
        pack();
    }// </editor-fold>
    private void jtxtDisplayActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
    }
    private void jBtn1ActionPerformed(java.awt.event.ActionEvent evt) {
        String Enternumber = jtxtDisplay.getText() + jBtn1.getText();
        jtxtDisplay.setText(Enternumber);
    }
    private void jBtn2ActionPerformed(java.awt.event.ActionEvent evt) {
        String Enternumber = jtxtDisplay.getText() + jBtn2.getText();
        jtxtDisplay.setText(Enternumber);
    }
    private void jBtn3ActionPerformed(java.awt.event.ActionEvent evt) {
        String Enternumber = jtxtDisplay.getText() + jBtn3.getText();
        jtxtDisplay.setText(Enternumber);
    }
    private void jBtn4ActionPerformed(java.awt.event.ActionEvent evt) {
        String Enternumber = jtxtDisplay.getText() + jBtn4.getText();
        jtxtDisplay.setText(Enternumber);
    }
    private void jBtn5ActionPerformed(java.awt.event.ActionEvent evt) {
        String Enternumber = jtxtDisplay.getText() + jBtn5.getText();
        jtxtDisplay.setText(Enternumber);
    }
```

```
private void jBtn6ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn6.getText();
    jtxtDisplay.setText(Enternumber);
}

private void jBtn7ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn7.getText();
    jtxtDisplay.setText(Enternumber);
}
private void jBtn8ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn8.getText();
    jtxtDisplay.setText(Enternumber);
}
private void jBtn9ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn9.getText();
    jtxtDisplay.setText(Enternumber);
}
private void jBtn17ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn17.getText();
    jtxtDisplay.setText("");
}
private void jBtn11ActionPerformed(java.awt.event.ActionEvent evt) {
    firstnum= Double.parseDouble(jtxtDisplay.getText());
    jtxtDisplay.setText("");
    operations="+";
}
private void jBtn12ActionPerformed(java.awt.event.ActionEvent evt) {
    firstnum= Double.parseDouble(jtxtDisplay.getText());
    jtxtDisplay.setText("");
    operations="-";
}
private void jBtn13ActionPerformed(java.awt.event.ActionEvent evt) {
    firstnum= Double.parseDouble(jtxtDisplay.getText());
    jtxtDisplay.setText("");
```

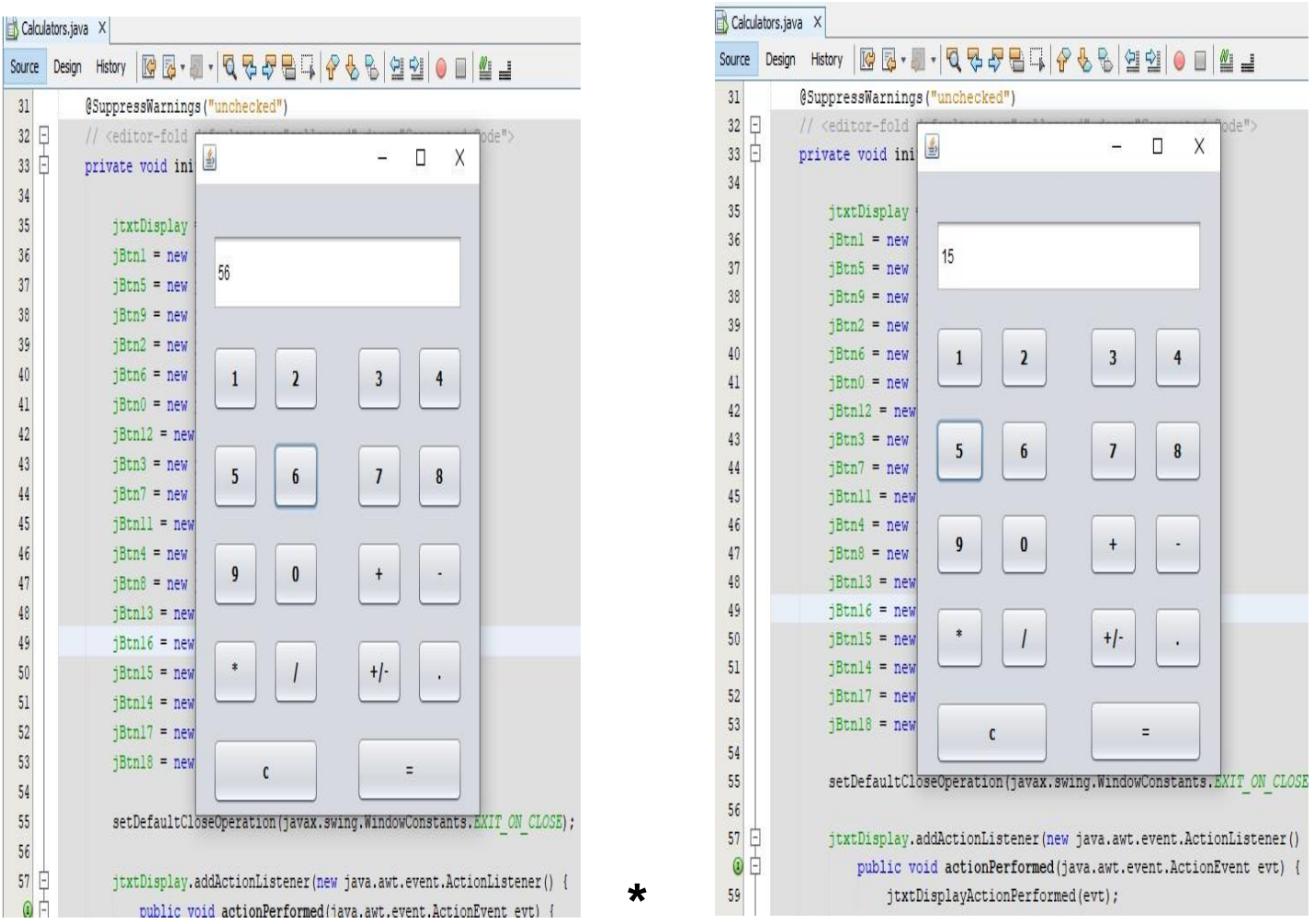
```
    operations="*";
}
private void jBtn14ActionPerformed(java.awt.event.ActionEvent evt) {
    firstnum= Double.parseDouble(jtxtDisplay.getText());
    jtxtDisplay.setText("");
    operations="/";
}
private void jBtn16ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn16.getText();
    jtxtDisplay.setText(Enternumber);
}
private void jBtn15ActionPerformed(java.awt.event.ActionEvent evt) {
    double ops = Double.parseDouble(String.valueOf(jtxtDisplay.getText()));
    ops = ops*(-1);
    jtxtDisplay.setText(String.valueOf(ops));
}

private void jBtn18ActionPerformed(java.awt.event.ActionEvent evt) {
    String ans;
    secondnum = Double.parseDouble(jtxtDisplay.getText());
    if(operations == "+")
    {
        result = firstnum+secondnum;
        ans = String.format("%.0f", result);
        jtxtDisplay.setText(ans);
    }
    else if(operations=="-")
    {
        result = firstnum-secondnum;
        ans = String.format("%.0f", result);
        jtxtDisplay.setText(ans);
    }
    else if(operations=="*")
    {
```

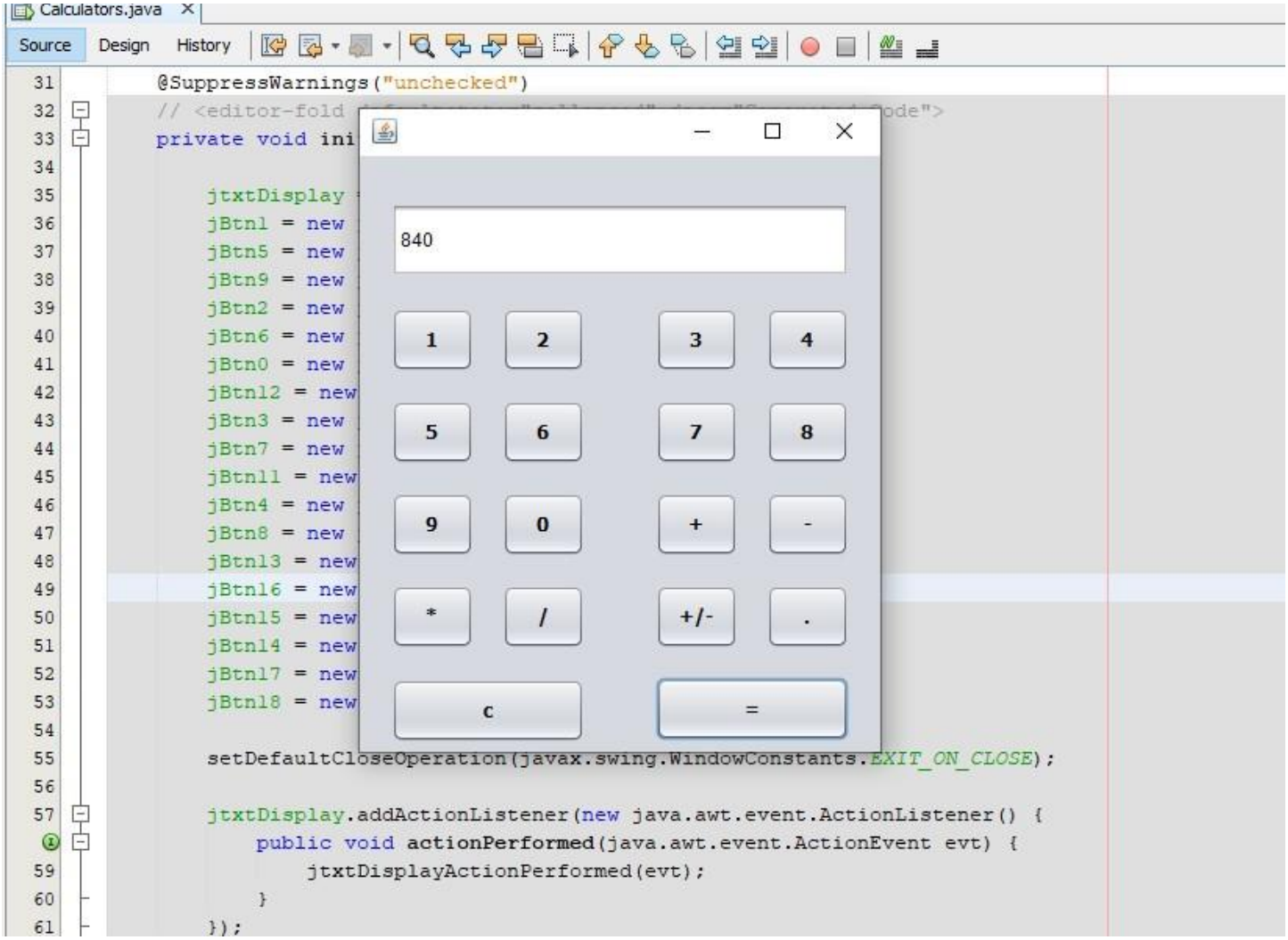
```
        result = firstnum*secondnum;
        ans = String.format("%.0f", result);
        jtxtDisplay.setText(ans);
    }
    else if(operations=="/")
    {
        result = firstnum/secondnum;
        ans = String.format("%.0f", result);
        jtxtDisplay.setText(ans);
    }
    else if(operations=="%")
    {
        result = firstnum%secondnum;
        ans = String.format("%.0f", result);
        jtxtDisplay.setText(ans);
    }
}
private void jBtn0ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = jtxtDisplay.getText() + jBtn0.getText();
    jtxtDisplay.setText(Enternumber);
}
/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    /* Set the Nimbus look and feel */
    //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
    /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
     * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
     */
    try {
        for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
            if ("Nimbus".equals(info.getName())) {
                javax.swing.UIManager.setLookAndFeel(info.getClassName());
```

```
                break;
            }
        }
    } catch (ClassNotFoundException ex) {
        java.util.logging.Logger.getLogger(Calculators.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (InstantiationException ex) {
        java.util.logging.Logger.getLogger(Calculators.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (IllegalAccessException ex) {
        java.util.logging.Logger.getLogger(Calculators.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (javax.swing.UnsupportedLookAndFeelException ex) {
        java.util.logging.Logger.getLogger(Calculators.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    }
    //</editor-fold>
    /* Create and display the form */
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            new Calculators().setVisible(true);
        }
    });
}
// Variables declaration - do not modify
private javax.swing.JButton jBtn0;
private javax.swing.JButton jBtn1;
private javax.swing.JButton jBtn11;
private javax.swing.JButton jBtn12;
private javax.swing.JButton jBtn13;
private javax.swing.JButton jBtn14;
private javax.swing.JButton jBtn15;
private javax.swing.JButton jBtn16;
private javax.swing.JButton jBtn17;
private javax.swing.JButton jBtn18;
private javax.swing.JButton jBtn2;
private javax.swing.JButton jBtn3;
private javax.swing.JButton jBtn4;
```

```
    private javax.swing.JButton jBtn5;
    private javax.swing.JButton jBtn6;
    private javax.swing.JButton jBtn7;
    private javax.swing.JButton jBtn8;
    private javax.swing.JButton jBtn9;
    private javax.swing.JTextField jtxtDisplay;
    // End of variables declaration
}
```

Output :-




Calculators.java
Source
Design
History
@SuppressWarnings("unchecked")
private void ini
jtxtDisplay
jBtn1 = new
jBtn5 = new
jBtn9 = new
jBtn2 = new
jBtn6 = new
jBtn0 = new
jBtn12 = new
jBtn3 = new
jBtn7 = new
jBtn11 = new
jBtn4 = new
jBtn8 = new
jBtn13 = new
jBtn16 = new
jBtn15 = new
jBtn14 = new
jBtn17 = new
jBtn18 = new
setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
jtxtDisplay.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
jtxtDisplayActionPerformed(evt);
}
});
840
1
2
3
4
5
6
7
8
9
0
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*
/
+/-
.
c
=

----------end----------