

Internet Application Development
Web Services - Assignment

Dated: Thursday, 15th May 2025

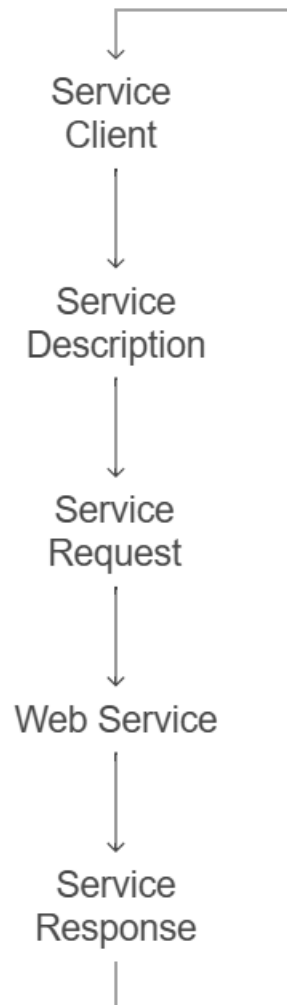
Registration No: _____ 03-3-1-023-2021

Full Name: _____ Jalal Ahmed

Q1) Draw web services execution model?

Answer:

Web Services Execution Model



Q2) Develop a web service with four web methods as follows:

- (a) Add
- (b) Subtract
- (c) Multiply
- (d) Divide

Answer:

```
<%@ Page Language="VB"
AutoEventWireup="false"
CodeFile="login_page.aspx.vb"
Inherits="Login" %>

<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title>Smart Calculator</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #f7f7f7;
        }

        .box {
            width: 350px;
            margin: 100px auto;
            padding: 20px;
            border: 1px solid #ccc;
            border-radius: 10px;
            text-align: center;
            background-color: #fff;
            box-shadow: 0 0 10px
                rgba(0,0,0,0.1);
        }

        .box input[type="text"], .box
        input[type="password"] {
            width: 90%;
            margin-bottom: 15px;
            padding: 10px;
            font-size: 16px;
        }

        .button-grid {
            display: grid;
            grid-template-columns:
                repeat(2, 1fr);
            gap: 10px;
            margin-bottom: 15px;
        }

        .box .btn {
            padding: 10px;
            font-size: 16px;
            cursor: pointer;
        }
    </style>
</head>
<body>
    <form id="form1" runat="server">
        <div class="box">
            <asp:TextBox ID="txtNum1"
                runat="server" placeholder="Enter first
                number" /><br />
            <asp:TextBox ID="txtNum2"
                runat="server" placeholder="Enter second
                number" /><br />
            <div class="button-grid">
                <asp:Button ID="btnAdd"
                    runat="server" Text="Add" CssClass="btn"
                    OnClick="btnAdd_Click" />
                <asp:Button
                    ID="btnSubtract" runat="server"
                    Text="Subtract" CssClass="btn"
                    OnClick="btnSubtract_Click" />
                <asp:Button
                    ID="btnMultiply" runat="server"
                    Text="Multiply" CssClass="btn"
                    OnClick="btnMultiply_Click" />
                <asp:Button ID="btnDivide"
                    runat="server" Text="Divide" CssClass="btn"
                    OnClick="btnDivide_Click" />
            </div>
            <asp:Button ID="btnClear"
                runat="server" Text="Clear" CssClass="btn"
                OnClick="btnClear_Click" /><br />
            <asp:Label ID="lblResult"
                runat="server" CssClass="result" />
        </div>
    </form>
</body>
</html>
```

```
.result {
    display: block;
    margin-top: 15px;
    font-weight: bold;
    font-size: 18px;
    color: green;
}

</style>
</head>
<body>
    <form id="form1" runat="server">
        <div class="box">
            <asp:TextBox ID="txtNum1"
                runat="server" placeholder="Enter first
                number" /><br />
            <asp:TextBox ID="txtNum2"
                runat="server" placeholder="Enter second
                number" /><br />
            <div class="button-grid">
                <asp:Button ID="btnAdd"
                    runat="server" Text="Add" CssClass="btn"
                    OnClick="btnAdd_Click" />
                <asp:Button
                    ID="btnSubtract" runat="server"
                    Text="Subtract" CssClass="btn"
                    OnClick="btnSubtract_Click" />
                <asp:Button
                    ID="btnMultiply" runat="server"
                    Text="Multiply" CssClass="btn"
                    OnClick="btnMultiply_Click" />
                <asp:Button ID="btnDivide"
                    runat="server" Text="Divide" CssClass="btn"
                    OnClick="btnDivide_Click" />
            </div>
            <asp:Button ID="btnClear"
                runat="server" Text="Clear" CssClass="btn"
                OnClick="btnClear_Click" /><br />
            <asp:Label ID="lblResult"
                runat="server" CssClass="result" />
        </div>
    </form>
</body>
</html>
```

Backendcode:

Partial Class Login

Inherits System.Web.UI.Page

```
Protected Sub btnAdd_Click(sender As  
Object, e As EventArgs)  
    Calculate("add")  
End Sub
```

```
Protected Sub btnSubtract_Click(sender  
As Object, e As EventArgs)  
    Calculate("subtract")  
End Sub
```

```
Protected Sub btnMultiply_Click(sender  
As Object, e As EventArgs)  
    Calculate("multiply")  
End Sub
```

```
Protected Sub btnDivide_Click(sender As  
Object, e As EventArgs)  
    Calculate("divide")  
End Sub
```

```
Protected Sub btnClear_Click(sender As  
Object, e As EventArgs)  
    txtNum1.Text = ""  
    txtNum2.Text = ""  
    lblResult.Text = ""  
End Sub
```

```
Private Sub Calculate(operation As  
String)  
    Dim num1 As Double, num2 As Double
```

```
If Double.TryParse(txtNum1.Text, num1)  
AndAlso Double.TryParse(txtNum2.Text, num2)  
Then  
    Select Case operation  
        Case "add"  
            lblResult.Text =  
                $"Result: {num1 + num2}"  
        Case "subtract"  
            lblResult.Text =  
                $"Result: {num1 - num2}"  
        Case "multiply"  
            lblResult.Text =  
                $"Result: {num1 * num2}"  
        Case "divide"  
            If num2 = 0 Then  
                lblResult.Text =  
                    "Error: Division by zero!"  
            Else  
                lblResult.Text =  
                    $"Result: {num1 / num2}"  
            End If  
        End Select  
    Else  
        lblResult.Text = "Please enter  
valid numbers."  
    End If  
End Sub  
End Class
```

Output:

A screenshot of a web-based calculator interface. It features two input fields at the top, the first containing the number '3' and the second containing '4'. Below these are four buttons arranged in a 2x2 grid: 'Add', 'Subtract', 'Multiply', and 'Divide'. A 'Clear' button is positioned centrally below the operation buttons. At the bottom, the text 'Result: 7' is displayed in a green font.

A screenshot of a web-based calculator interface. The first input field contains the number '4' and the second contains '3'. The buttons for 'Add', 'Subtract', 'Multiply', and 'Divide' are arranged in a 2x2 grid. A 'Clear' button is located below the operation buttons. The result 'Result: 1' is shown at the bottom in green text.

Q3) Test the web service using browser on local pc.

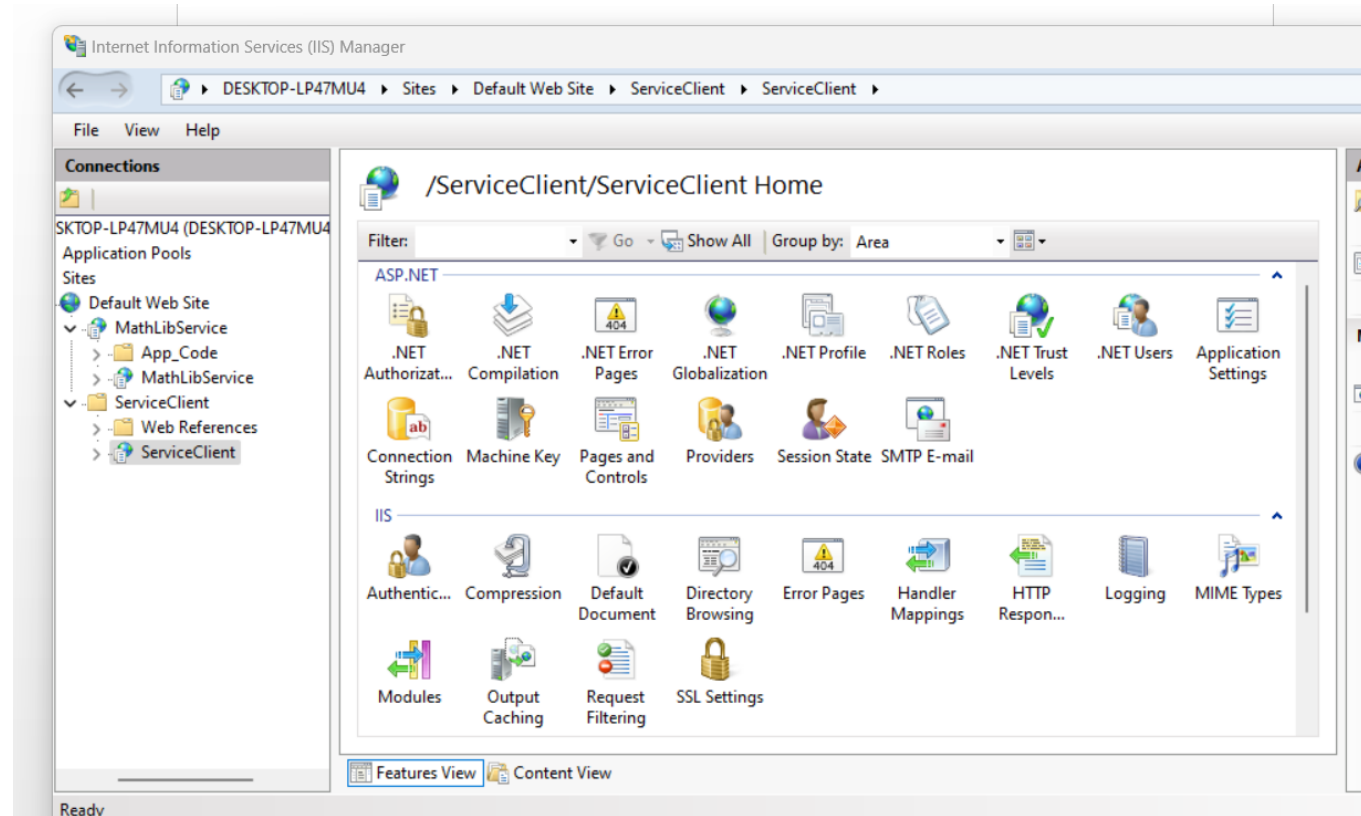
Install Internet Information Services on your laptop/pc (if not installed)

Using IIS manager create two separate applications as follows:

(a) MathLibService

(b) ServiceClient

Answer:



Q4) Implement a web application “ServiceClient” which will use the MathLibService as a web service. Develop a suitable web page for its demonstration. Use some text boxes to take input from user. Use proxy class to get answer (response from web service) and display it on page to user.

Note:

- (i) This is an individual student assignment.
- (ii) Submission of copied work (by any means/through any channel) will lead to poor grades.
- (iii) Deadline is 22:00 on 18th May 2025. Submit a report (pdf) including above solved problems on your own portal.