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Assignment :

Web Services

05/18/2025

Q1) Draw web services execution model?



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



Lets create an application with a webform MathLibService.aspx and .vb.

MathLibService.asmx

<%@ WebService Language="VB" Class="MathLibService" %>

MathLibService.vb

Imports System.Web.Services

<WebService(Namespace:="http://tempuri.org/")>

<WebServiceBinding(ConformsTo:=WsiProfiles.BasicProfile1_1)>

<Global.Microsoft.VisualBasic.CompilerServices.DesignerGenerated()>

Public Class MathLibService

Inherits System.Web.Services.WebService

<WebMethod>

Public Function Add(a As Double, b As Double) As String

Return (a + b).ToString()

End Function

<WebMethod>

Public Function Subtract(a As Double, b As Double) As String

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```
Return (a - b).ToString()
```

End Function

<WebMethod>

Public Function Multiply(a As Double, b As Double) As String

Return (a * b).ToString()

End Function

<WebMethod>

Public Function Divide(a As Double, b As Double) As String

If b = 0 Then

Return "Cannot divide by zero"

End If

```
Return (a / b).ToString()
```

End Function

End Class

Lets Install IIS:

Open "Turn Windows features on or off" and enable following options:

- 1. Internet Information Services
- 2. ASP.NET (under .NET Framework 4.x)
- 3. Application Development Features \rightarrow ASP.NET, ISAPI Extensions, ISAPI Filters

This will install IIS on our machine.

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IAD WEB SERVICES

I created a folder named MathLibService on root directory of IIS

Ð	> This	PC > Loca	al Disk (C:) 🔹 🔹	inetpub >	www.root	>		
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	Nar	me		Date m	nodified	Туре	Size	
	🚞 as	spnet_client		5/18/2	025 4:30 PM	File folder		
	— M	lathLibService		5/18/2	025 5:48 PM	File folder		

And inside that folder I copied all the files

×	MathLibService	× +		
Ç	> This PC > Local Disk (C:)	> inetpub > wwwroot	> MathLibService >	
		∽ ≣ View ∽ ····		
	Name	Date modified	Type Size	2
	.vs	5/18/2025 4:37 PM	File folder	
	App_Code	5/18/2025 4:37 PM	File folder	
•	🕮 MathLibService.asmx	5/18/2025 4:36 PM	ASP.NET Web Serv	1 KB
•	📲 Web Services.sIn	5/18/2025 4:34 PM	Visual Studio Solut	2 KB
	web.config	5/18/2025 5:48 PM	CONFIG File	1 KB

n I opened IIS Mana Id Wabsita	ager						2	V
							f	~
iite name:		Application pool:						
MathLibService		MathLibService			Se	lect		
Content Directory								
Physical path:								
C:\inetpub\wwwroo	t\MathLibService							
Pass-through auther	ntication							
Connect as	Test Settings							
Binding								
Туре:	IP address:			Port:				
http ~	All Unassigned	d l	~	6767				
Host name: Example: www.conto	oso.com or marke	ting.contoso.com						
Host name: Example: www.conto	oso.com or marke	ting.contoso.com						
Host name: Example: www.conto	oso.com or marke diately	ting.contoso.com						
Host name: Example: www.conto	oso.com or marke diately	ting.contoso.com		OK			ancel	

IAD WEB SERVIC	ES									05/18/2	025
also enabled MathLibServ	the Dir	ectory Brow	sing Op	otion							
Filter: IIS Authentic Compression	• Co • C	Show All Group by: Ar Directory Browsing	Handler Mappings	• 📰 • HTTP Respon	Logging	MIME Types	Modules	Output Caching	Request Filtering	SSL Settings	
Directory Brows Use this feature to specify the info Time Size Extension Date	sing ormation that displa	ays in a directory listing.								Actions Apply Cancel Disable Help	

Then As we Right click our application and click on Browse.

	Explore Edit Permissions	ate	
() ()	Add Application Add Virtual Directory		
	Edit Bindings		
	Manage Website	2	Restart
49	Refresh	₽	Start
×	Remove		Stop
	Rename	•	Browse
	Switch to Content View		Advanced Settings

It shows

 \mathbf{G} 1 localhost:6767 🔒 STEAMUNLOCKED »... 🧲 OlaMovies Official... m wkvCinemas PC an... 🔡 🛛 🕥 step K How the darknet, d... 💓 Und localhost - /

 Sunday, May 18, 2025
 4:37 PM
 <dir>
 App_Code

 Sunday, May 18, 2025
 4:36 PM
 59 MathLibSe

 Sunday, May 18, 2025
 4:34 PM
 1732 Web Servi

 Sunday, May 18, 2025
 5:48 PM
 218 web.confi

59 MathLibService.asmx 1732 <u>Web Services.sln</u> 218 web.config

Now as we click on MathLibService.asmx it shows:

← → C O localhost 6767/MathLibService.asmx
🔠 📀 step 🔓 STEAMUNLOCKED » S OlaMovies Official 🌇 mkvCinemas PC an 🦹 How the darknet, d 💋 Understanding Dark 🐗 Dark Web Risks: A D 💿 What is the dark we
MathLibService
The following operations are supported. For a formal definition, please review the Service Description.
• Add
• <u>Divide</u>
• <u>Multiply</u>
• <u>Subtract</u>
This web service is using http://tempuri.org/ as its default namespace.
Recommendation: Change the default namespace before the XML Web service is made public.
Each XML Web service needs a unique namespace in order for client applications to distinguish it from other services on the Web. http://tempuri.org/ is available for XML Web services that are under developm permanent namespace.
Your XML Web service should be identified by a namespace that you control. For example, you can use your company's Internet domain name as part of the namespace. Although many XML Web service name resources on the Web. (XML Web service namespaces are URIs.)
For XML Web services creating using ASP.NET, the default namespace can be changed using the WebService attribute's Namespace property. The WebService attribute is an attribute applied to the class that co example that sets the namespace to "http://microsoft.com/webservices/":
C#
<pre>[WebService(Namespace="http://microsoft.com/webservices/")] public class MyMebService { // implementation }</pre>
Visual Basic
<webservice(namespace:="http: ")="" microsoft.com="" webservices=""> Fublic Class MyWebService 'implementation End Class</webservice(namespace:="http:>
C++
<pre>[WebService(Namespace="http://microsoft.com/webservices/")] public ref class MyWebService (</pre>

For more details on XML namespaces, see the W3C recommendation on <u>Namespaces in XML</u>. For more details on WSDL, see the <u>WSDL Specification</u>.

Lets check the Add feature:

MathLibService

Click here for a complete list of operations.

Add

Test

To test the operation using the HTTP POST protocol, click the 'Invoke' button.

Parameter	Value
Farameter	value

a:	1
b:	3
	Invoke

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As you can see that it is giving us a single string:						
← → C ③ localhost:6767/MathLibService.asmx/Add						
🔡 📔 😌 step 🦸 STEAMUNLOCKED » 🧲 OlaMovies Official	mkvCinemas PC an	K How the darknet, d	💓 Understa			
This XML file does not appear to have any style information associated with it. The document tree is shown below.						
<pre><string xmlns="http://tempuri.org/">4</string></pre>						

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) <u>MathLibService</u>

(b) <u>ServiceClient</u>

As I already installed IIS by enabling following options in "Turn Windows features on or off":

- 1. Internet Information Services
- 2. ASP.NET (under .NET Framework 4.x)
- 3. Application Development Features \rightarrow ASP.NET, ISAPI Extensions, ISAPI Filters

As we created MathLibService already, lets cerate ServiceClient (another application).

Lets add Service Reference

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dd Service Reference		? ×
To see a list of available services c for available services, click Discov	on a specific server, enter a service URL and clie er.	ck Go. To browse
Address:		
http://localhost/MathLibService/M	1athLibService.asmx	o Discover -
Services:	Operations:	
▲ ÷⊕ MathLibService •⊖ MathLibServiceSoap	 Add Divide Multiply Subtract 	
1 service(s) found at address 'http	://localhost/MathLibService/MathLibService.as	smx'.
1 service(s) found at address 'http Namespace: Mathl ibRef	://localhost/MathLibService/MathLibService.as	:mx'.
1 service(s) found at address 'http Namespace: MathLibRef	://localhost/MathLibService/MathLibService.as	smx'.
1 service(s) found at address 'http Namespace: MathLibRef Advanced	://localhost/MathLibService/MathLibService.as	:mx'. Cancel
1 service(s) found at address 'http Namespace: MathLibRef Advanced ck OK. reated a Client.aspx webform.	://localhost/MathLibService/MathLibService.as	smx'. Cancel
1 service(s) found at address 'http Namespace: MathLibRef Advanced ck OK. reated a Client.aspx webform.	://localhost/MathLibService/MathLibService.as	cancel
1 service(s) found at address 'http Namespace: MathLibRef Advanced ck OK. reated a Client.aspx webform.	://localhost/MathLibService/MathLibService.as	mx'. Cancel
1 service(s) found at address 'http Namespace: MathLibRef Advanced ck OK. reated a Client.aspx webform. i <u>ent.aspx</u> 6@ Page Language="VB" AutoEv	ventWireup="false" CodeFile="Client.aspx.v	cancel

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<!DOCTYPE html> <html xmlns="http://www.w3.org/1999/xhtml"> <head runat="server"> <title>MathLib Service Client</title> </head> <body> <form id="form1" runat="server"> <div> <h2>Math Operations using Web Service</h2> <asp:Label ID="lbIA" runat="server" Text="Enter A: " /> <asp:TextBox ID="txtA" runat="server" />
 <asp:Label ID="IbIB" runat="server" Text="Enter B: " /> <asp:TextBox ID="txtB" runat="server" />
 <asp:Button ID="btnAdd" runat="server" Text="Add" OnClick="btnAdd_Click" /> <asp:Button ID="btnSub" runat="server" Text="Subtract" OnClick="btnSub_Click" /> <asp:Button ID="btnMul" runat="server" Text="Multiply" OnClick="btnMul_Click" /> <asp:Button ID="btnDiv" runat="server" Text="Divide" OnClick="btnDiv_Click" />

<asp:Label ID="IblResult" runat="server" Font-Bold="True" /> </div>

</form>

</body>

</html>

Client.aspx.vb

Partial Class Client

Inherits System.Web.UI.Page

' Create the object using the correct proxy class name (from Add Web Reference)

Dim service As New MathLibRef.MathLibServiceSoapClient()

Protected Sub btnAdd_Click(sender As Object, e As EventArgs)

Dim a As Integer = Integer.Parse(txtA.Text)

Dim b As Integer = Integer.Parse(txtB.Text)

Dim result As Integer = service.Add(a, b)

lblResult.Text = "Result: " & result.ToString()

End Sub

Protected Sub btnSub_Click(sender As Object, e As EventArgs)

Dim a As Integer = Integer.Parse(txtA.Text)

Dim b As Integer = Integer.Parse(txtB.Text)

Dim result As Integer = service.Subtract(a, b)

lblResult.Text = "Result: " & result.ToString()

End Sub

Protected Sub btnMul_Click(sender As Object, e As EventArgs)

Dim a As Integer = Integer.Parse(txtA.Text)

Dim b As Integer = Integer.Parse(txtB.Text)

Dim result As Integer = service.Multiply(a, b)

lblResult.Text = "Result: " & result.ToString()

End Sub

Protected Sub btnDiv_Click(sender As Object, e As EventArgs)

Dim a As Integer = Integer.Parse(txtA.Text)

Dim b As Integer = Integer.Parse(txtB.Text)

Dim result As Integer = service.Divide(a, b)

lblResult.Text = "Result: " & result.ToString()

End Sub

End Class

The Directory Structure looks like this:

Solution Explorer 🔻 🖡	×
Search Solution Explorer (Ctrl+;)	D -
Solution 'ServiceClient' (1 of 1 project)	
▲	
App_WebReferences	
🔺 🔄 MathLibRef	
 A general Reference.svcmap 	
📸 configuration.svcinfo	
configuration91.svcinfo	
MathLibService.disco	
MathLibService.wsdl	
🔺 🍙 Client.aspx	
Client.aspx.vb	
🔜 ServiceClient.sln	
🖓 Web.config	

Now lets create application on IIS

I copied files to C:\inetpub\wwwroot\ServiceClient so that IIS can access it

IAL	I WEB SERVICES				05/18/2025
×	ServiceClient	× +			
С.	> This PC > Local Disk (C:)	> inetpub > ww	wroot > ServiceClier	nt >	
Ō	▲ ▲ ▲ Sort	~ 🔳 View ~			
	Name	Date modifi	ed Type	Size	
	.vs	5/18/2025 5	:45 PM File folder		
	App_WebReferences	5/18/2025 5	:45 PM File folder		
*	① Client.aspx	5/18/2025 5	:43 PM ASP.NET Serve	er Pa 2 KB	
*	Client.aspx.vb	5/18/2025 5	:50 PM VB File	2 KB	
ا د	ServiceClient.sln	5/18/2025 5	:44 PM Visual Studio	Solut 2 KB	
*	Web.config	5/18/2025 5	:48 PM CONFIG File	1 KB	

Now open IIS Manager and add another application:

dd Website <pre>? Ster name: Application pool: ServiceClient ServiceClient Select Content Directory Physical path: C:\inetpub\wwwroot\ServiceClient Pass-through authentication Connect as Test Settings Binding Type: P address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel</pre>	
Site name: Application pool: ServiceClient ServiceClient Select Content Directory Physical path: CALLENDED WANNOOT ServiceClient Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http I All Unassigned I I I I I I I I I I I I I I I I I I I	×
ServiceClient Select Content Directory Physical path: C<\inetpub\wwwroot\ServiceClient Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Content Directory Physical path: C:\inetpub\wwwroot\ServiceClient Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http v All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Physical path: C:\inetpub\wwwroot\ServiceClient Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http I All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
C\inetpub\wwwroot\ServiceClient Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Pass-through authentication Connect as Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Connect as Test Settings Binding Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Binding Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Type: IP address: Port: http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
http All Unassigned 9494 Host name: Example: www.contoso.com or marketing.contoso.com Example: www.contoso.com or marketing.contoso.com OK Cancel	
Host name: Example: www.contoso.com or marketing.contoso.com Start Website immediately OK Cancel	
Start Website immediately OK Cancel	

As you can see that there are two applications on IIS:





ADD:

Math Operations using Web Service

Enter A	A: 10		
Enter l	B: 2		
Add	Subtract	Multiply	Divide

Result: 12

Subtract:

Math Operations using Web Service

Enter A: 1	0		
Enter B: 2			
Add Sut	otract	Multiply	Divide

Result: 8

<u>ultiply:</u>	
Math Operations using Web Serv	ice
Enter A: 10	
Enter B: 2	
Add Subtract Multiply Divide	
Result: 20	

Division:

Math Operations using Web Service

Enter A:	10		
Enter B:	2		
Add	ubtract	Multiply	Divide

Result: 20