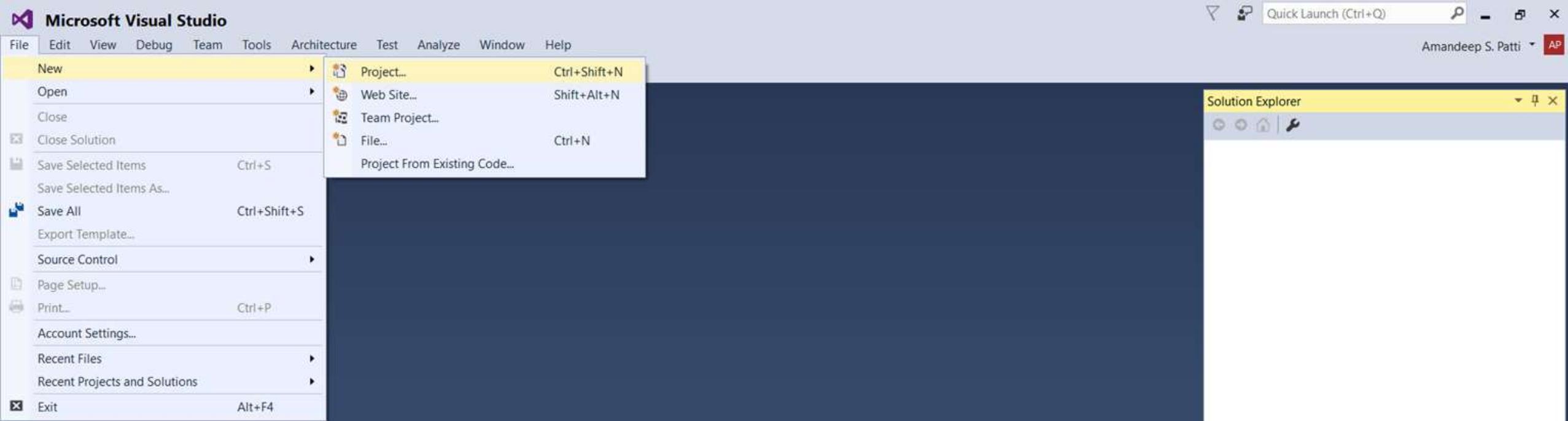


# WebAPI Unit Testing using Visual Studio

by Amandeep S. Patti



# Amandeep S. Patti

## New Project



Recent

.NET Framework 4.5.2

Sort by: Default



Search Installed Templates (Ctrl+E)



Installed

Templates

- ▷ Visual C#
- ▷ Visual Basic
- Visual F#
- ▷ Visual C++
- SQL Server
- Python
- ▷ JavaScript
- ▷ TypeScript
- Game
- Build Accelerator

Other Project Types

- Setup and Deployment
- Visual Studio Solutions**

Modeling Projects

Samples

Online



Blank Solution

Visual Studio Solutions

Type: Visual Studio Solutions

Create an empty solution containing no projects

# Amandeep S. Patti

[Click here to go online and find templates.](#)

Name: WebAPITesting

Location: c:\demos

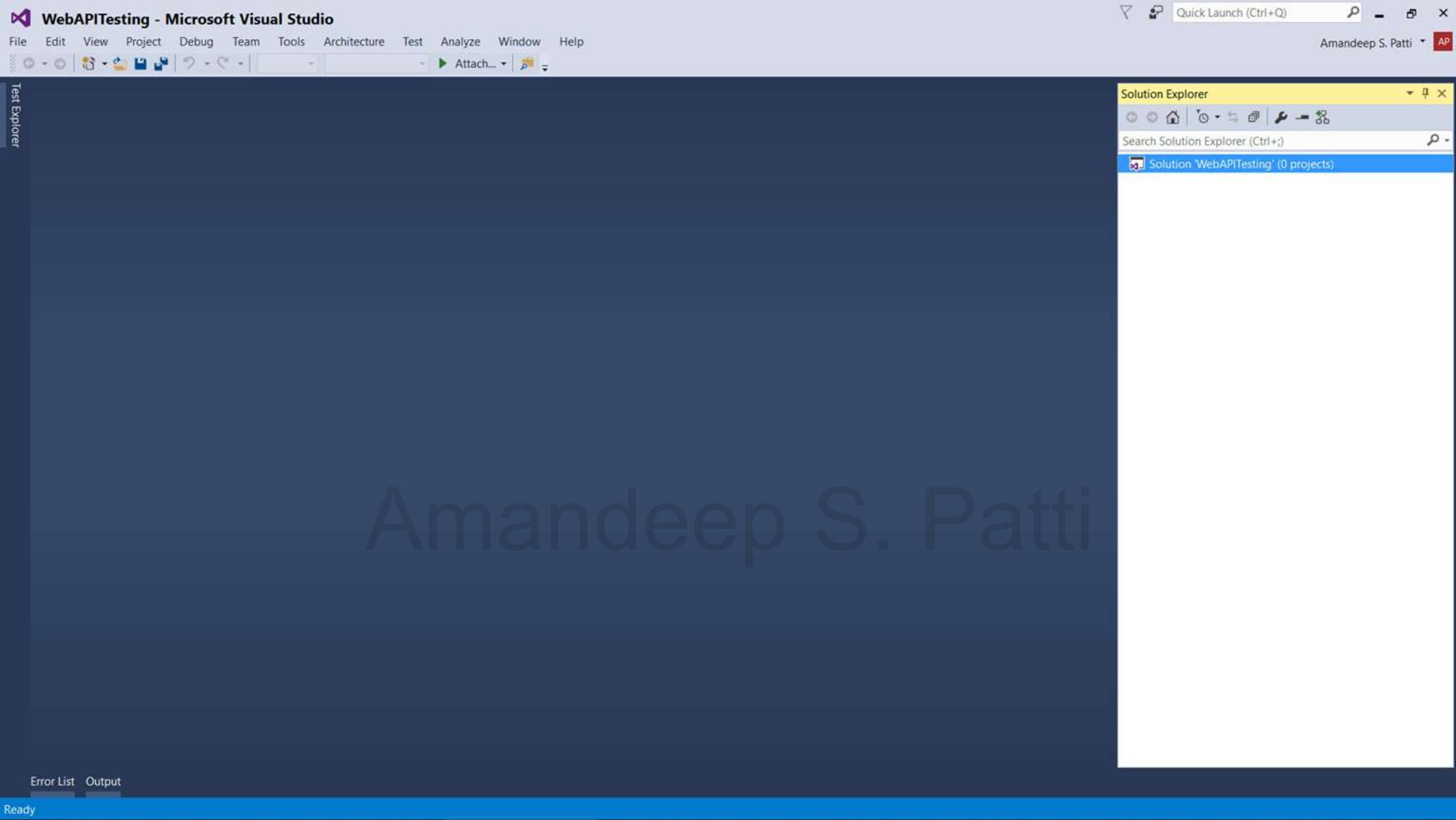
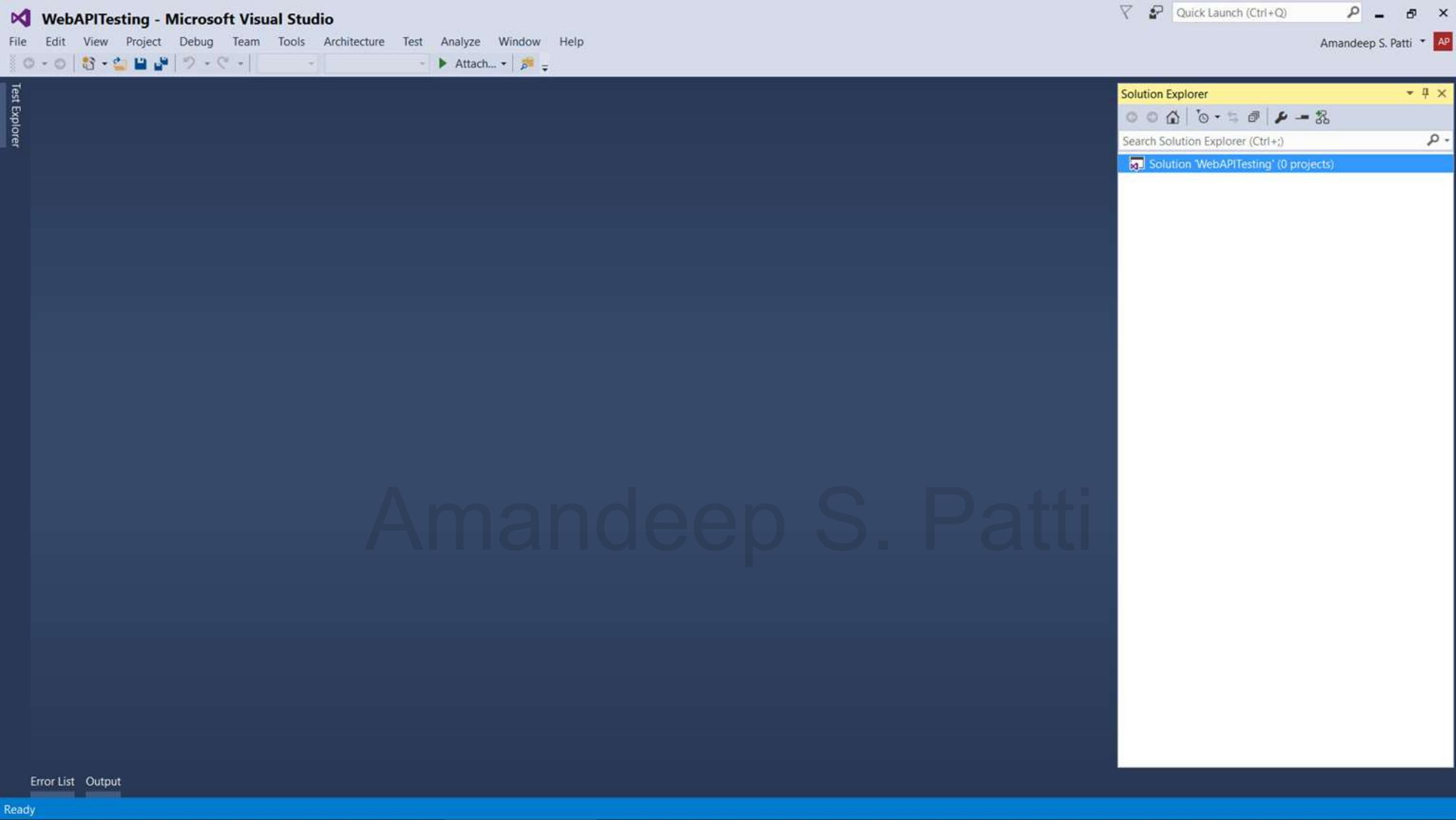
Solution name: WebAPITesting

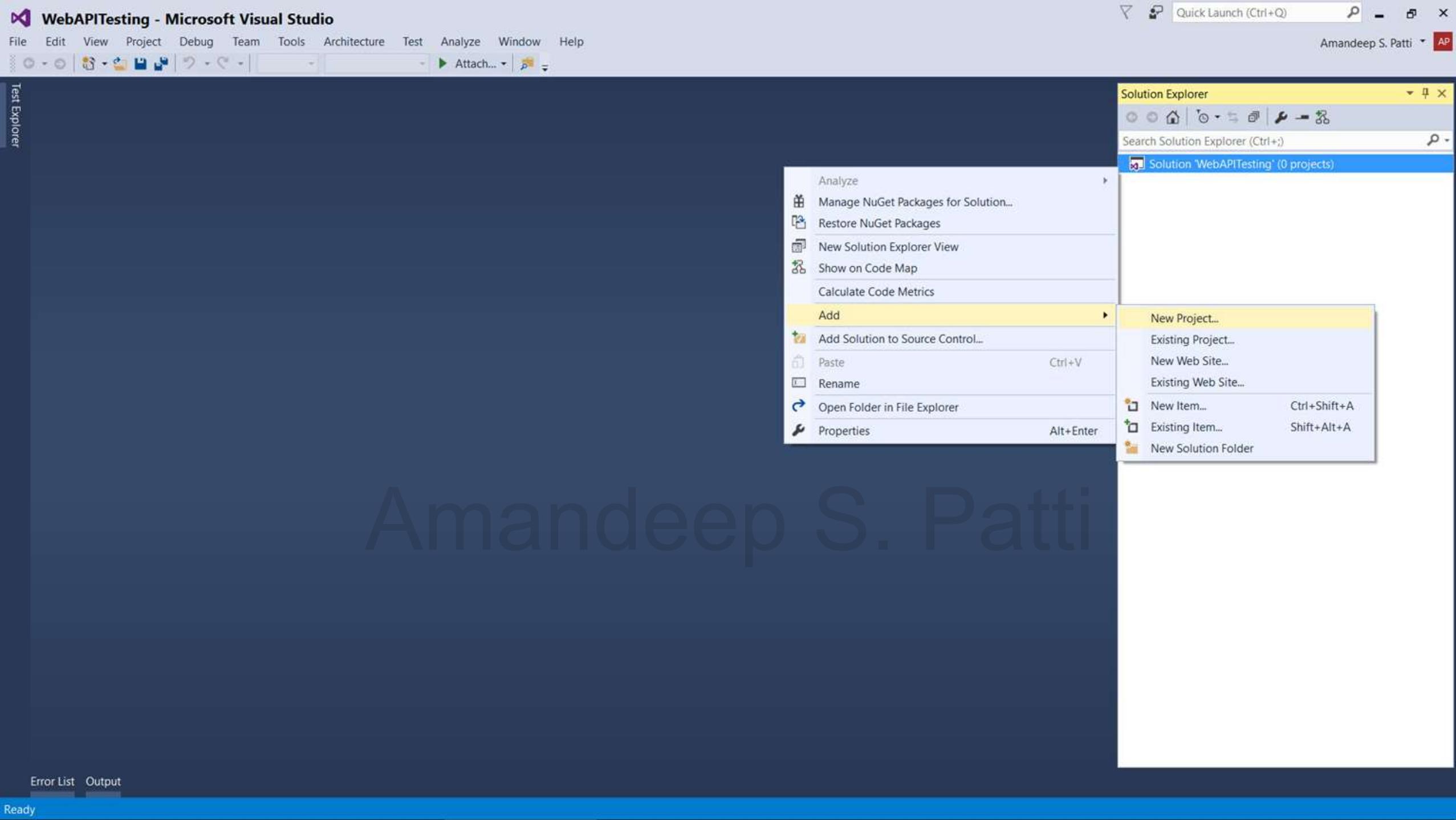
Create directory for solution

Add to source control

OK

Cancel





## Add New Project



Recent

Installed

Visual C#

Windows

Web

Android

Cloud

Extensibility

iOS

LightSwitch

Office/SharePoint

Silverlight

Test

WCF

Workflow

Visual Basic

Visual F#

Visual C++

SQL Server

Python

JavaScript

TypeScript

Game

Build Accelerator

Online

.NET Framework 4.5.2

Sort by: Default



Search Installed Templates (Ctrl+E)



Windows Forms Application

Visual C#



WPF Application

Visual C#



Console Application

Visual C#



Shared Project

Visual C#



Class Library (Portable for iOS, Android and Windows)

Visual C#



Class Library

Visual C#



Class Library (Portable)

Visual C#

[Click here to go online and find templates.](#)

Name:

StudentDBModel

Location:

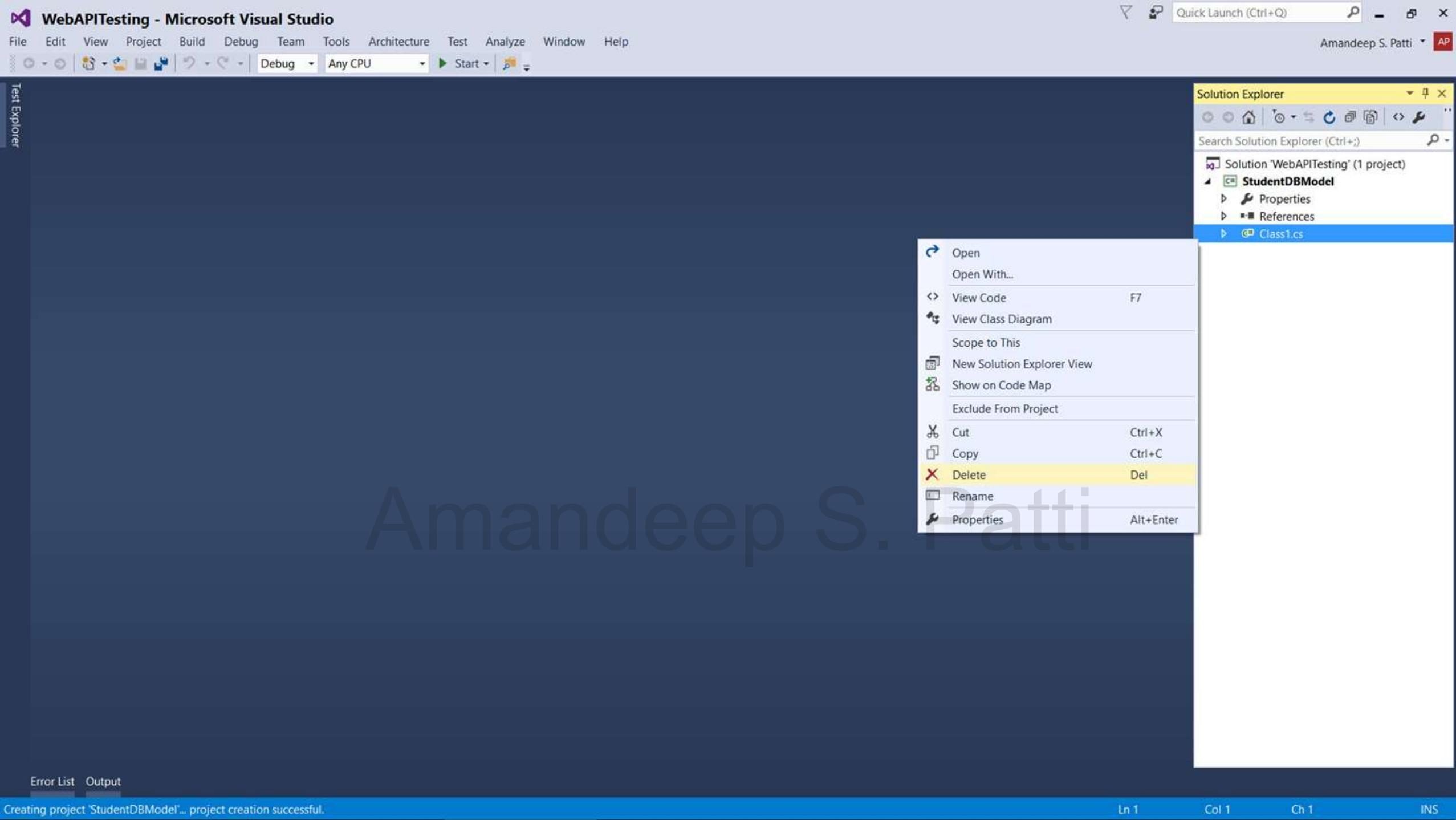
c:\demos\WebAPITesting

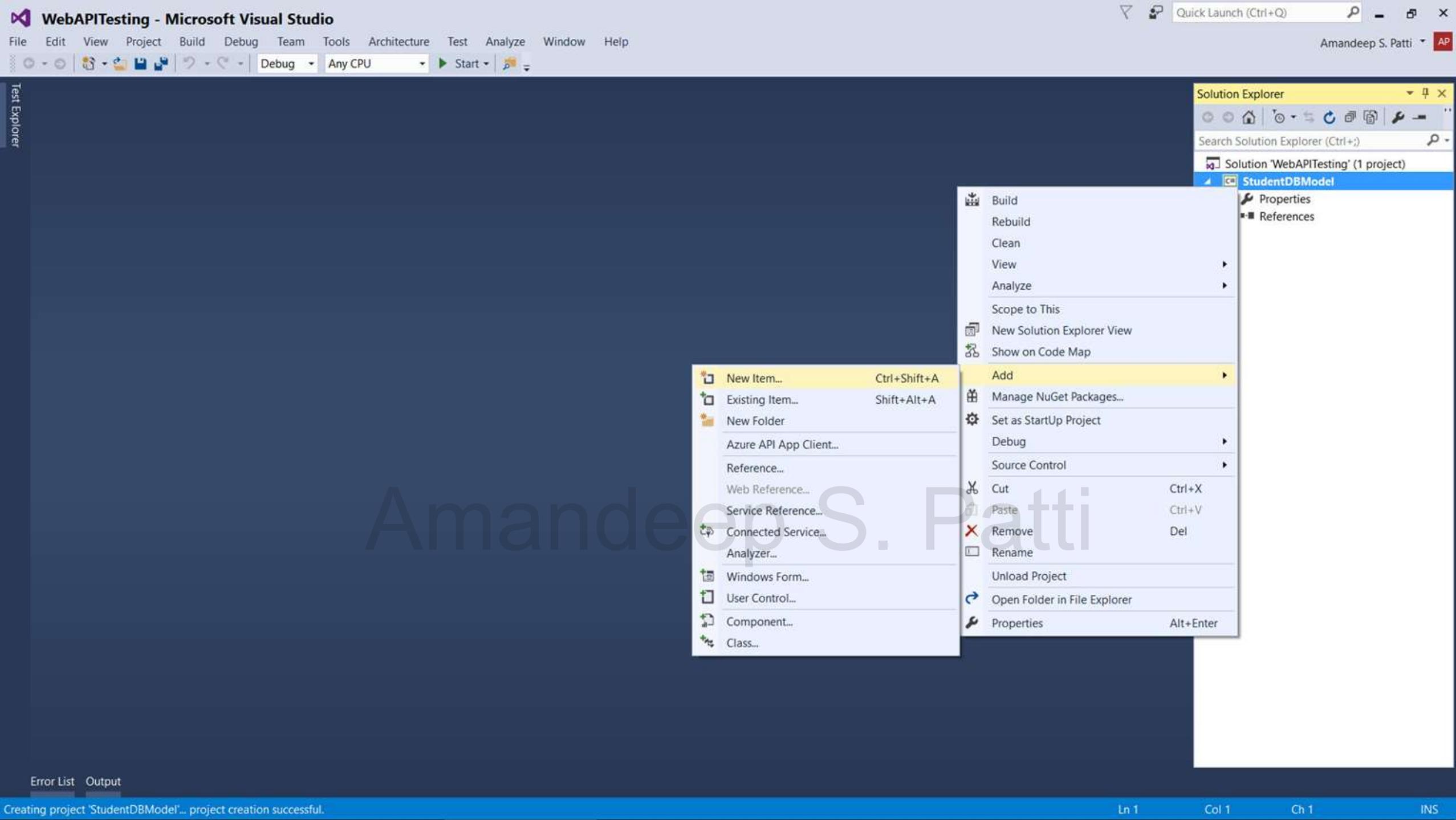
[Browse...](#)

OK

Cancel

Amandeep S. Patti





## Add New Item - StudentDBModel



Installed

Sort by: Default



Search Installed Templates (Ctrl+E)

Visual C# Items

Code

Data

General

Web

Windows Forms

WPF

SQL Server

Workflow

Online



ADO.NET Entity Data Model

Visual C# Items



DataSet

Visual C# Items



EF 5.x DbContext Generator

Visual C# Items



EF 6.x DbContext Generator

Visual C# Items



LINQ to SQL Classes

Visual C# Items



Service-based Database

Visual C# Items



XML File

Visual C# Items



XML Schema

Visual C# Items



XSLT File

Visual C# Items

Type: Visual C# Items

A project item for creating an ADO.NET Entity Data Model.

[Click here to go online and find templates.](#)

Name:

StudentDBModel

Add

Cancel

## Entity Data Model Wizard



### Choose Model Contents

What should the model contain?



EF Designer  
from  
database



Empty EF  
Designer  
model



Empty Code  
First model



Code First  
from  
database

Creates a model in the EF Designer based on an existing database. You can choose the database connection, settings for the model, and database objects to include in the model. The classes your application will interact with are generated from the model.

< Previous

Next >

Finish

Cancel

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## Entity Data Model Wizard



### Choose Your Data Connection

Which data connection should your application use to connect to the database?

New Connection...

This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?

- No, exclude sensitive data from the connection string. I will set it in my application code.
- Yes, include the sensitive data in the connection string.

Connection string:

  
Amandeep S. Patti

Save connection settings in App.Config as:

< Previous

Next >

Finish

Cancel

## Connection Properties

?

X

Enter information to connect to the selected data source or click "Change" to choose a different data source and/or provider.

Data source:

Microsoft SQL Server (SqlClient)

Change...

Server name:

(LocalDB)\MSSQLLocalDB

Refresh

Log on to the server

Use Windows Authentication

Use SQL Server Authentication

User name:

Password:

Save my password

Connect to a database

Select or enter a database name:

StudentDB

Attach a database file:

Browse...

Logical name:

Advanced...

Test Connection

OK

Cancel

## Entity Data Model Wizard



### Choose Your Data Connection

Which data connection should your application use to connect to the database?

54ee75141614\localdb#ac289216.StudentDB.dbo

New Connection...

This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?

- No, exclude sensitive data from the connection string. I will set it in my application code.
- Yes, include the sensitive data in the connection string.

Connection string:

```
metadata=res://*/StudentDBModel.csdl|res://*/StudentDBModel.ssdl|
res://*/StudentDBModel.msl;provider=System.Data.SqlClient;provider connection string="data
source=(LocalDB)\MSSQLLocalDB;initial catalog=StudentDB;integrated
security=True;MultipleActiveResultSets=True;App=EntityFramework"
```

Save connection settings in App.Config as:

StudentDBEntities

< Previous

Next >

Finish

Cancel

## Entity Data Model Wizard



### Choose Your Version

Which version of Entity Framework do you want to use?

- Entity Framework 6.x
- Entity Framework 5.0

i It is also possible to install and use other versions of Entity Framework.  
[Learn more about this](#)

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< Previous

Next >

Finish

Cancel

## Entity Data Model Wizard



### Choose Your Database Objects and Settings

Which database objects do you want to include in your model?

- ▼  Tables
  - ▼  dbo
    - Students
    - Views
    - Stored Procedures and Functions

Pluralize or singularize generated object names

Include foreign key columns in the model

Import selected stored procedures and functions into the entity model

Model Namespace:

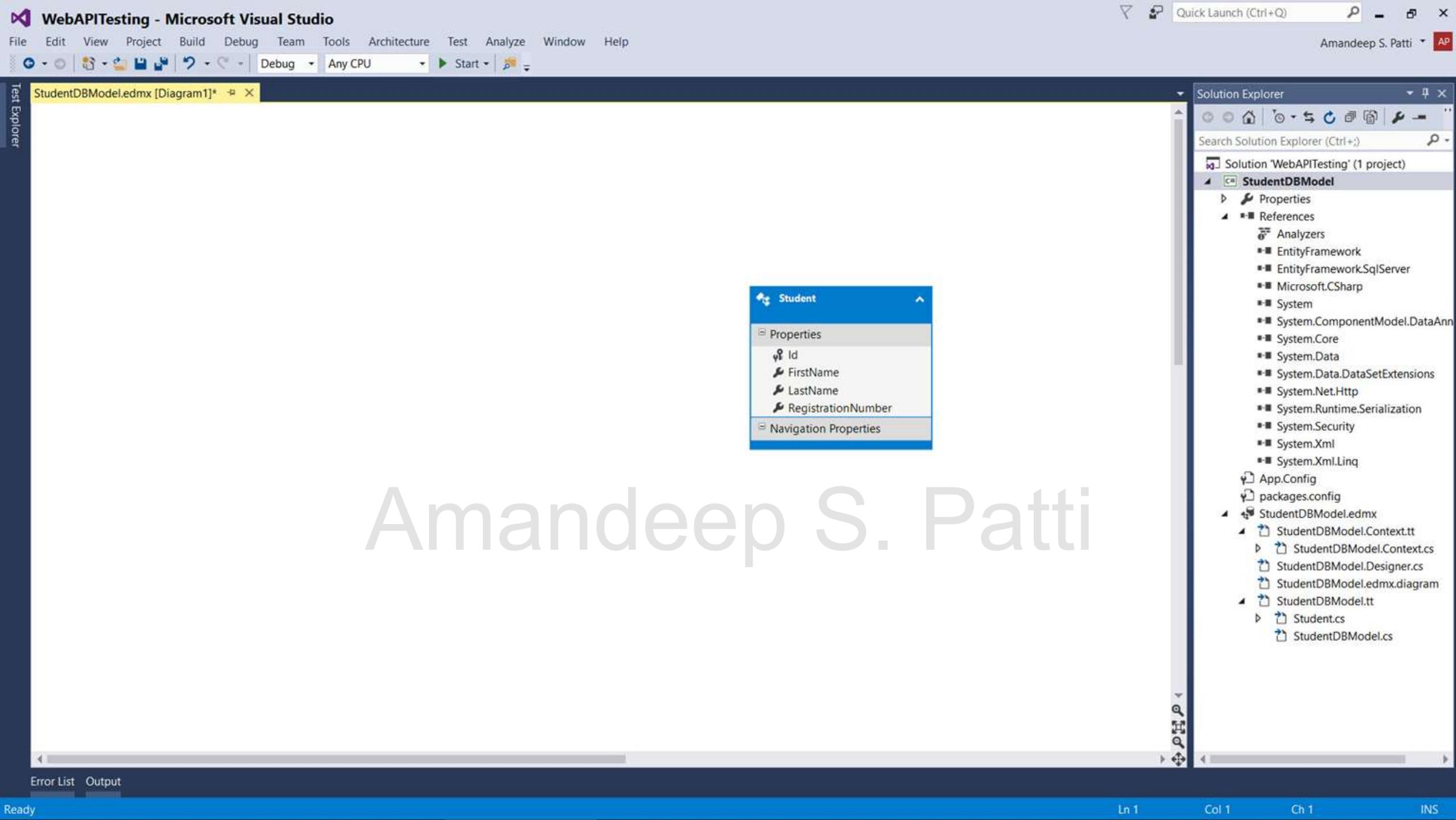
StudentDBModel

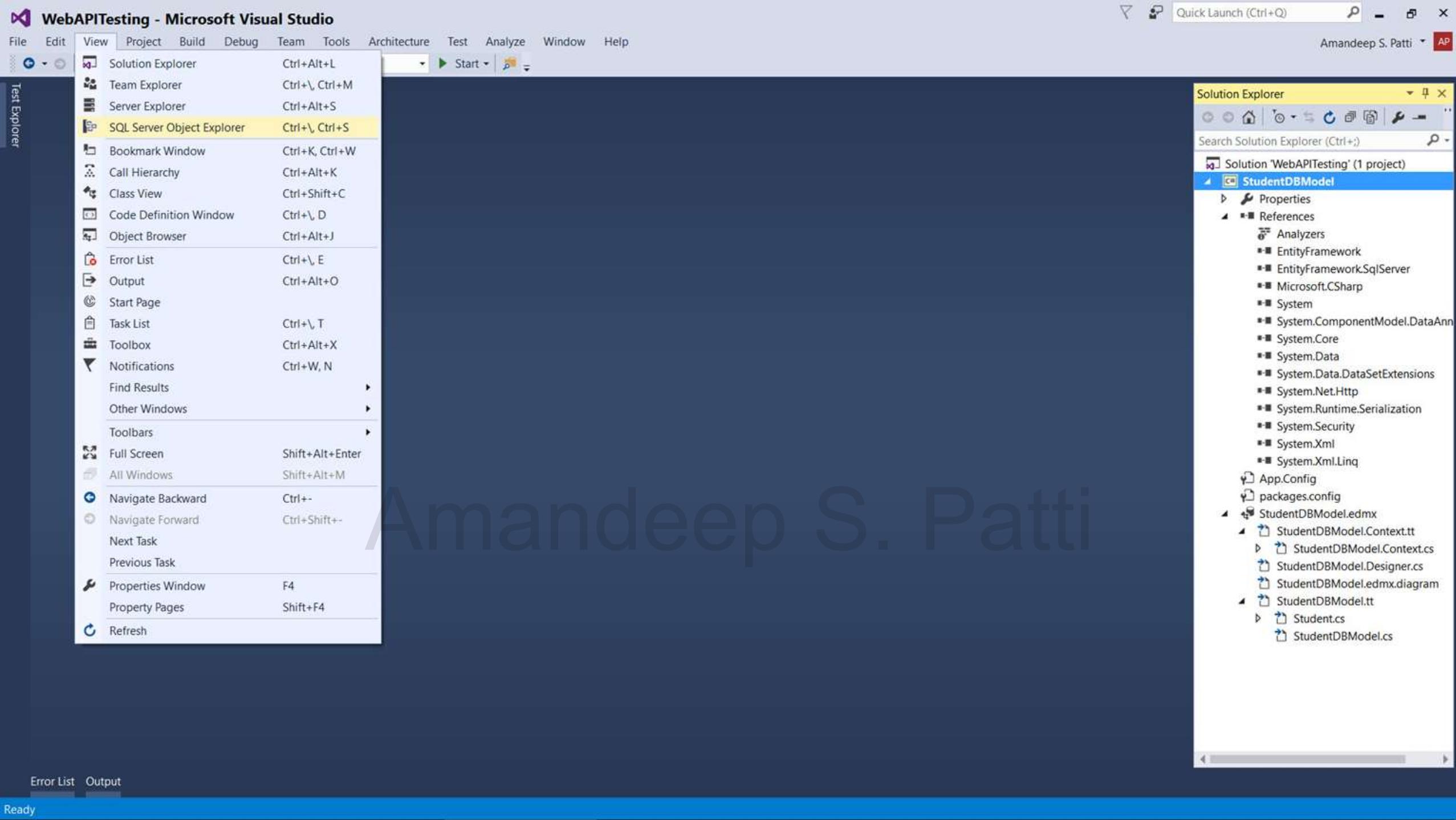
< Previous

Next >

Finish

Cancel





WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

SQL Server Object Explorer

Test Explorer

Debug Any CPU Start

SQL Server Object Explorer (Search SQL Server Object Explorer (Ctrl+Shift+F))

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'WebAPITesting' (1 project)

StudentDBModel

- Properties
- References
  - Analyzers
  - EntityFramework
  - EntityFramework.SqlServer
  - Microsoft.CSharp
  - System
  - System.ComponentModel.DataAnnotations
  - System.Core
  - System.Data
  - System.Data.DataSetExtensions
  - System.Net.Http
  - System.Runtime.Serialization
  - System.Security
  - System.Xml
  - System.Xml.Linq
- App.Config
- packages.config

StudentDBModel.edmx

- StudentDBModel.Context.tt
  - StudentDBModel.Context.cs
  - StudentDBModel.Designer.cs
  - StudentDBModel.edmx.diagram
- StudentDBModel.tt
  - Student.cs
  - StudentDBModel.cs

Error List Output

Ready

The screenshot shows the Microsoft Visual Studio interface with the title bar "WebAPITesting - Microsoft Visual Studio". The menu bar includes File, Edit, View, Project, Build, Debug, Team, Tools, Architecture, Test, Analyze, Window, and Help. The toolbar has icons for Save, Undo, Redo, Cut, Copy, Paste, Find, and Replace. The status bar at the bottom says "Ready".

The main window contains three panes:

- SQL Server Object Explorer** (left): Shows the database structure. It lists "SQL Server" and "(localdb)\MSSQLLocalDB (SQL Server 12.0.2000 - 54EE75141614\Administr...". Under "StudentDB", it shows "Tables" and "dbo.Students". The "Columns" node under "dbo.Students" is expanded, showing columns: Id (PK, int, not null), FirstName (nvarchar(max), not null), LastName (nvarchar(max), not null), and RegistrationNumber (nvarchar(max), not null). A context menu is open over the "dbo.Students" node, with "View Data" highlighted.
- Solution Explorer** (right): Shows the solution structure for "WebAPITesting". It includes "StudentDBModel" with its properties, references (EntityFramework, EntityFramework.SqlServer, Microsoft.CSharp, System, System.ComponentModel.DataAnnotations, System.Core, System.Data, System.Data.DataSetExtensions, System.Net.Http, System.Runtime.Serialization, System.Security, System.Xml, System.Xml.Linq), and files like App.Config, packages.config, StudentDBModel.edmx, StudentDBModel.Context.tt, StudentDBModel.Designer.cs, StudentDBModel.edmx.diagram, StudentDBModel.tt, Student.cs, and StudentDBModel.cs.
- Test Explorer** (bottom left): Shows the test results for the solution.

A large watermark "Amandeep S. Patti" is overlaid across the center of the screen.

**WebAPITesting - Microsoft Visual Studio**

File Edit View Project Build Debug Team SQL Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q) Amandeep S. Patti AP

SQL Server Object Explorer

Test Explorer

SQL Server Object Explorer [dbo.Students [Data]]

Max Rows: 1000

Id	FirstName	LastName	RegistrationNumber
2	Stephen	Killen	N0001
4	Brian	Tat	N0002
5	Clay	Rockall	N0003
6	Rui	Maduro	N0004
*	NULL	NULL	NULL

Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'WebAPITesting' (1 project)

StudentDBModel

- Properties
- References
  - Analyzers
  - EntityFramework
  - EntityFramework.SqlServer
  - Microsoft.CSharp
  - System
  - System.ComponentModel.DataAnnotations
  - System.Core
  - System.Data
  - System.Data.DataSetExtensions
  - System.Net.Http
  - System.Runtime.Serialization
  - System.Security
  - System.Xml
  - System.Xml.Linq
- App.Config
- packages.config

StudentDBModel.edmx

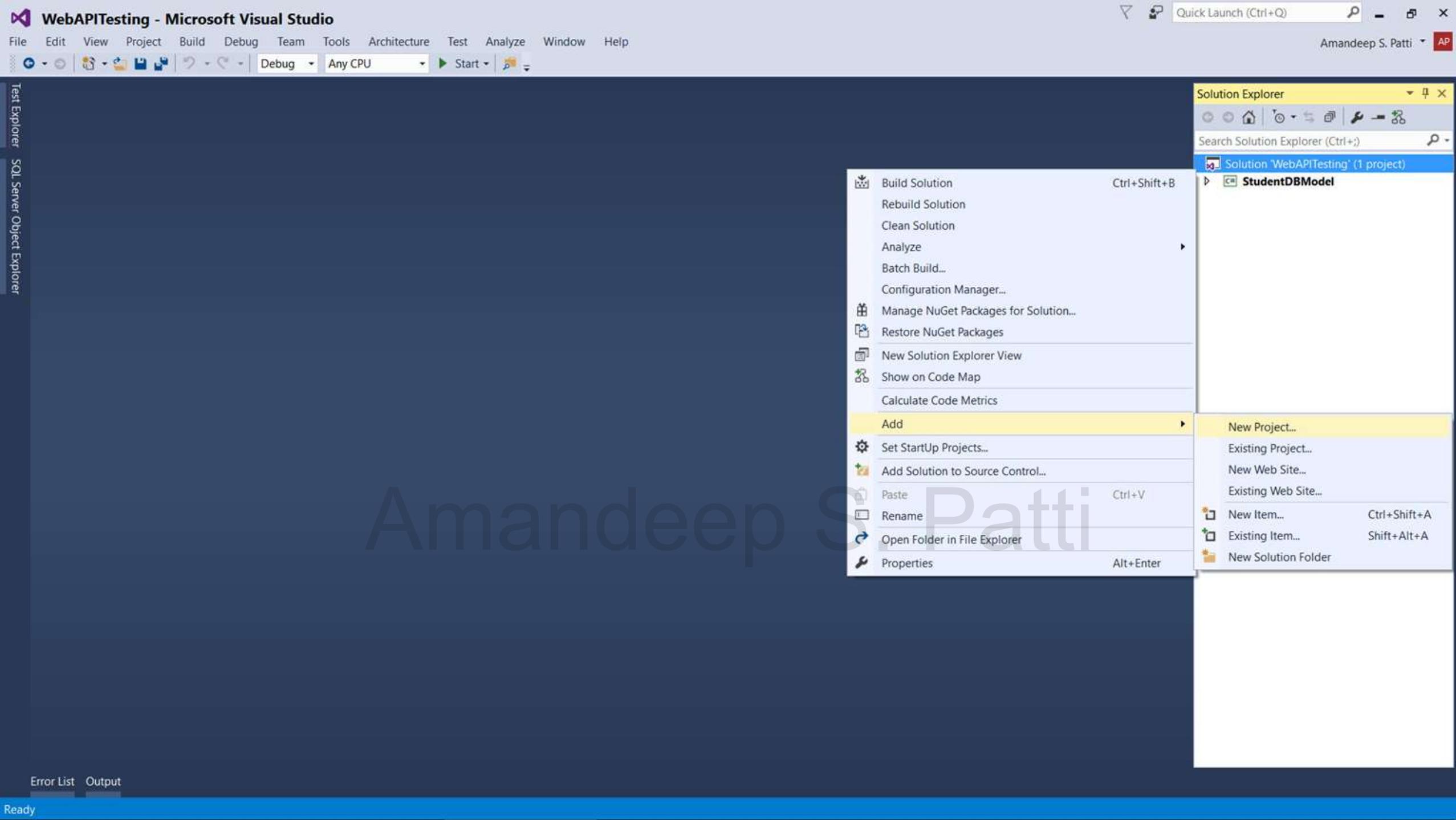
- StudentDBModel.Context.tt
  - StudentDBModel.Context.cs
  - StudentDBModel.Designer.cs
  - StudentDBModel.edmx.diagram
- StudentDBModel.tt
  - Student.cs
  - StudentDBModel.cs

Connection Ready (localdb)\MSSQLLocalDB 54EE75141614\Administr... StudentDB

Error List Output

4 Rows | Cell is Read Only Ln 1 Col 1

Amandeep S. Patti



## Add New Project

?

X

Recent

.NET Framework 4.5.2

Sort by: Default



Search Installed Templates (Ctrl+E)



Installed

Visual C#

Windows



Android

Cloud

Extensibility

iOS

LightSwitch

Office/SharePoint

Silverlight

Test

WCF

Workflow

Visual Basic

Visual F#

Visual C++

SQL Server

Python

JavaScript

TypeScript

Game

Build Accelerator

Online



ASP.NET Web Application

Visual C#

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.

Application Insights

Add Application Insights to project

Optimize performance and monitor usage in your live application.

aspatti@live.com (Microsoft acc...)

Azure Pass

Send telemetry to:

New Application Insights resource

Configure settings...

[Help me understand Application Insights](#)

[Privacy statement](#)

[Click here to go online and find templates.](#)

Name:

StudentManagement

Location:

c:\demos\WebAPITesting

Browse...

OK

Cancel

# New ASP.NET Project - StudentManagement



Select a template:

## ASP.NET 4.5.2 Templates



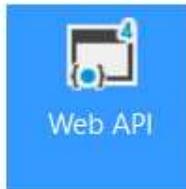
Empty



Web Forms



MVC



Web API



Single Page  
Application



Azure API App  
(Preview)



Azure Mobile  
Service

## ASP.NET 5 Templates



Get ASP.NET 5 RC

Add folders and core references for:

Web Forms  MVC  Web API

Add unit tests

Test project name:

A project template for creating RESTful HTTP services that can reach a broad range of clients including browsers and mobile devices.

[Learn more](#)

[Change Authentication](#)

Authentication: **Individual User Accounts**

Microsoft Azure

Host in the cloud

OK

Cancel

## Change Authentication

X

- No Authentication
- Individual User Accounts
- Work And School Accounts
- Windows Authentication

For applications that don't require any user authentication.

[Learn more](#)

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OK

Cancel

# New ASP.NET Project - StudentManagement



Select a template:

## ASP.NET 4.5.2 Templates



Empty



Web Forms



MVC



Web API



Single Page  
Application



Azure API App  
(Preview)



Azure Mobile  
Service

## ASP.NET 5 Templates



Get ASP.NET 5 RC

Add folders and core references for:

Web Forms  MVC  Web API

Add unit tests

Test project name:

A project template for creating RESTful HTTP services that can reach a broad range of clients including browsers and mobile devices.

[Learn more](#)

[Change Authentication](#)

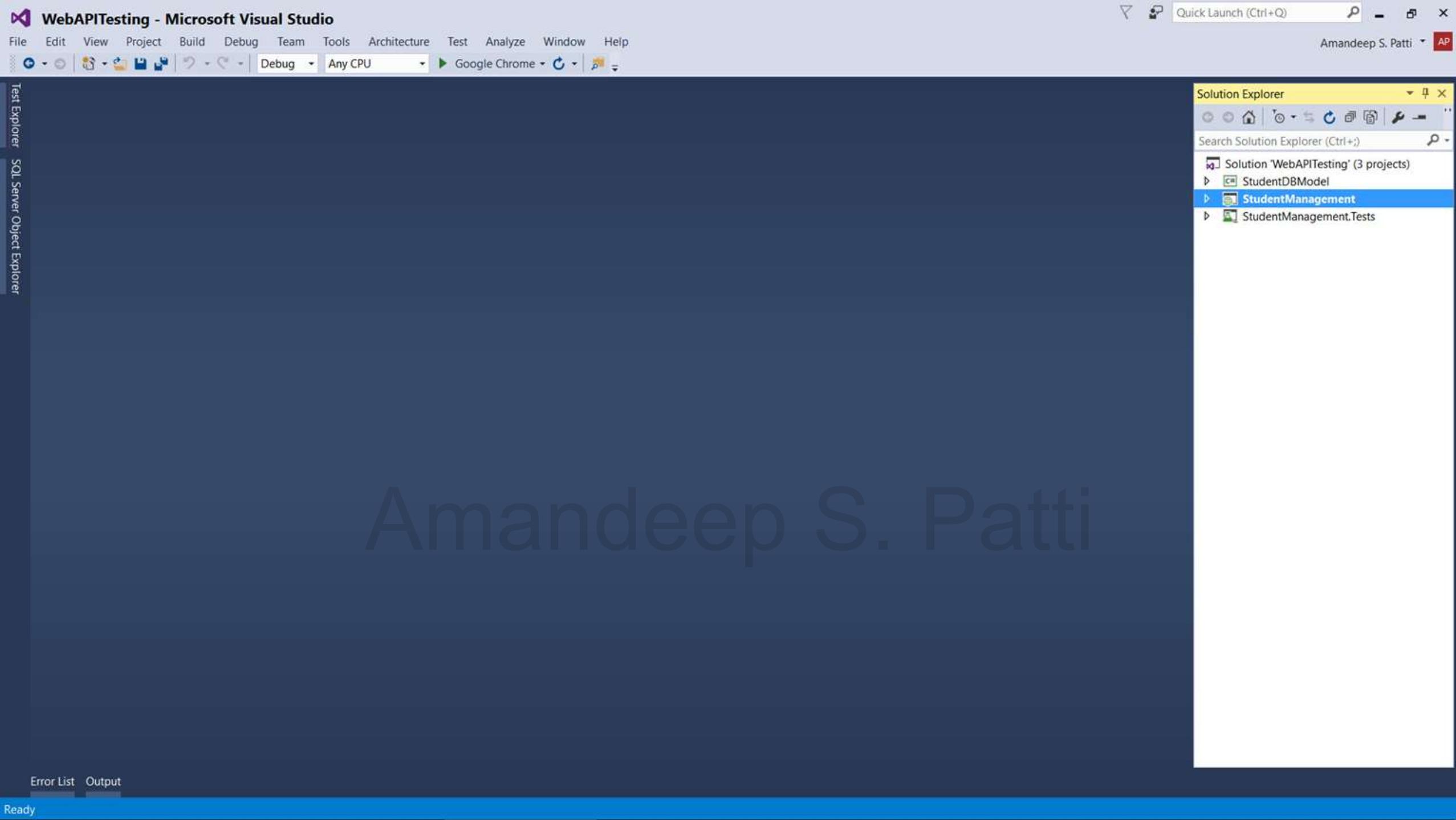
Authentication: **No Authentication**

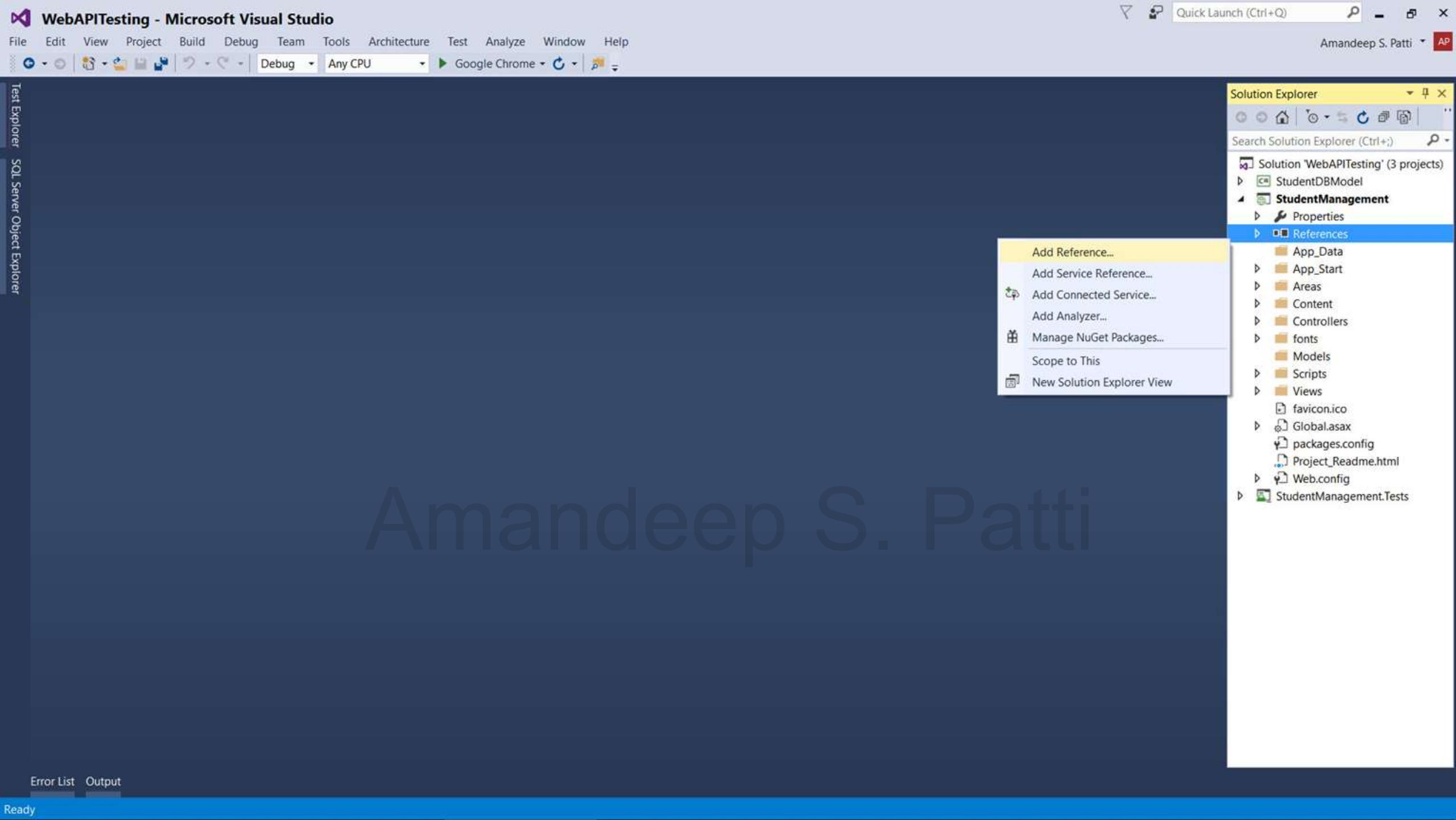
Microsoft Azure

Host in the cloud

OK

Cancel





## Reference Manager - StudentManagement

?

X

▷ Assemblies

◀ Projects

Solution

▷ COM

▷ Browse

Search Projects (Ctrl+E)



	Name	Path
<input checked="" type="checkbox"/>	StudentDBModel	c:\demos\WebAPITesting\
	StudentManagement.Tests	c:\demos\WebAPITesting\

**Name:**

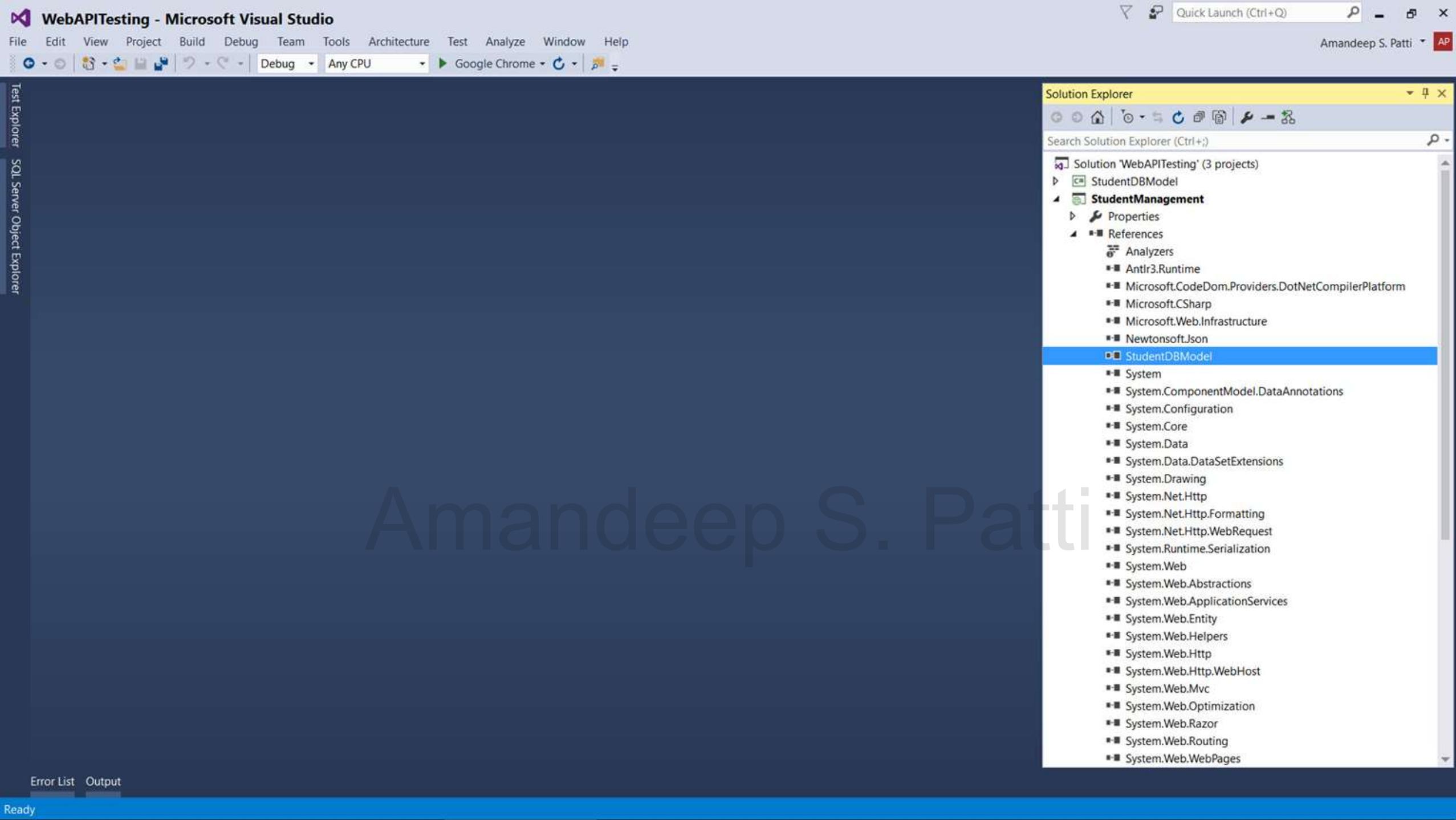
StudentDBModel

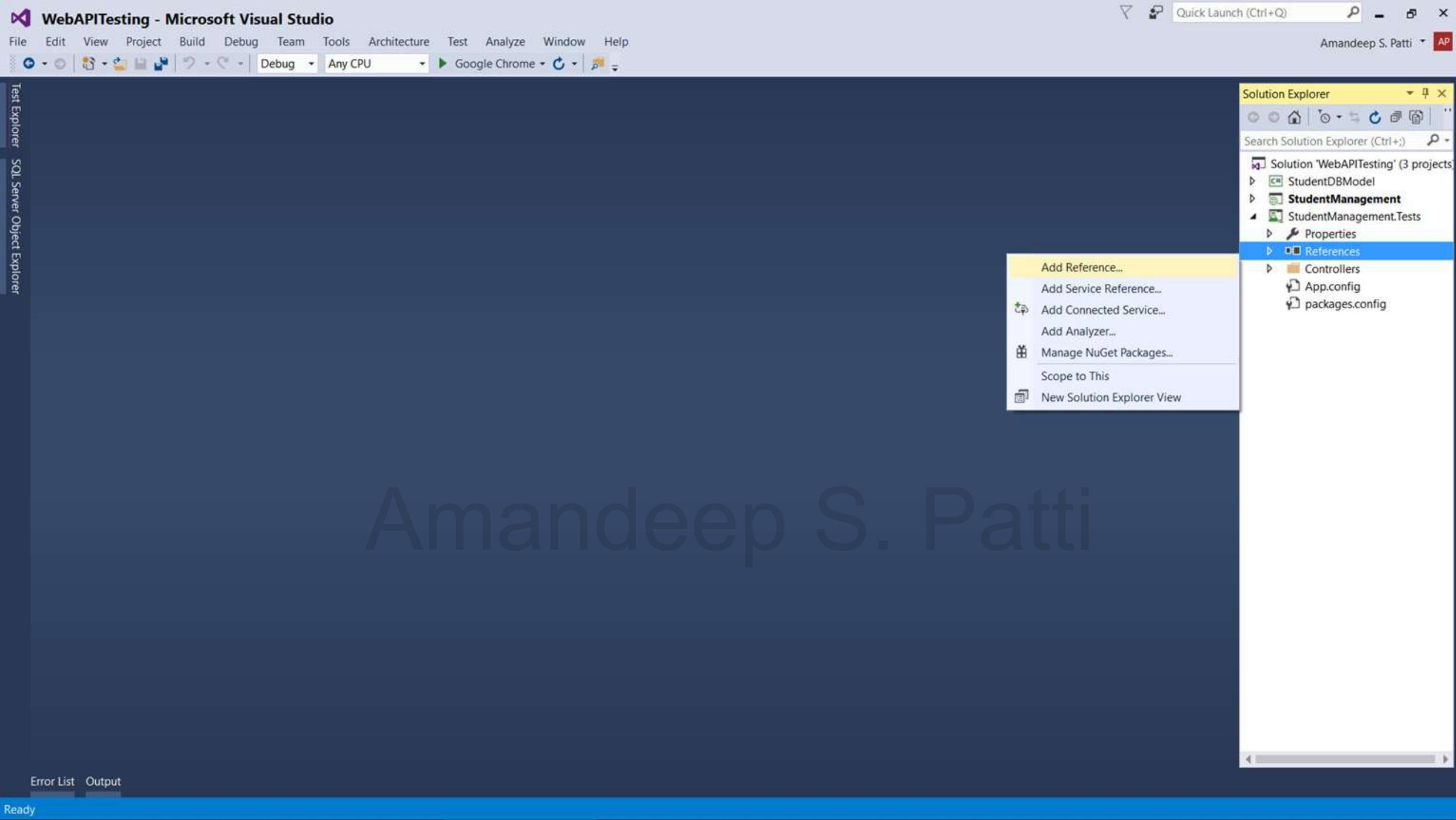
Browse...

OK

Cancel

# Amandeep S. Patti





## Reference Manager - StudentManagement.Tests

?

X

Assemblies

Projects

Solution

COM

Browse

Search Projects (Ctrl+E)



	Name	Path
<input checked="" type="checkbox"/>	StudentDBModel	c:\demos\WebAPITesting\
<input checked="" type="checkbox"/>	StudentManagement	c:\demos\WebAPITesting\

**Name:**

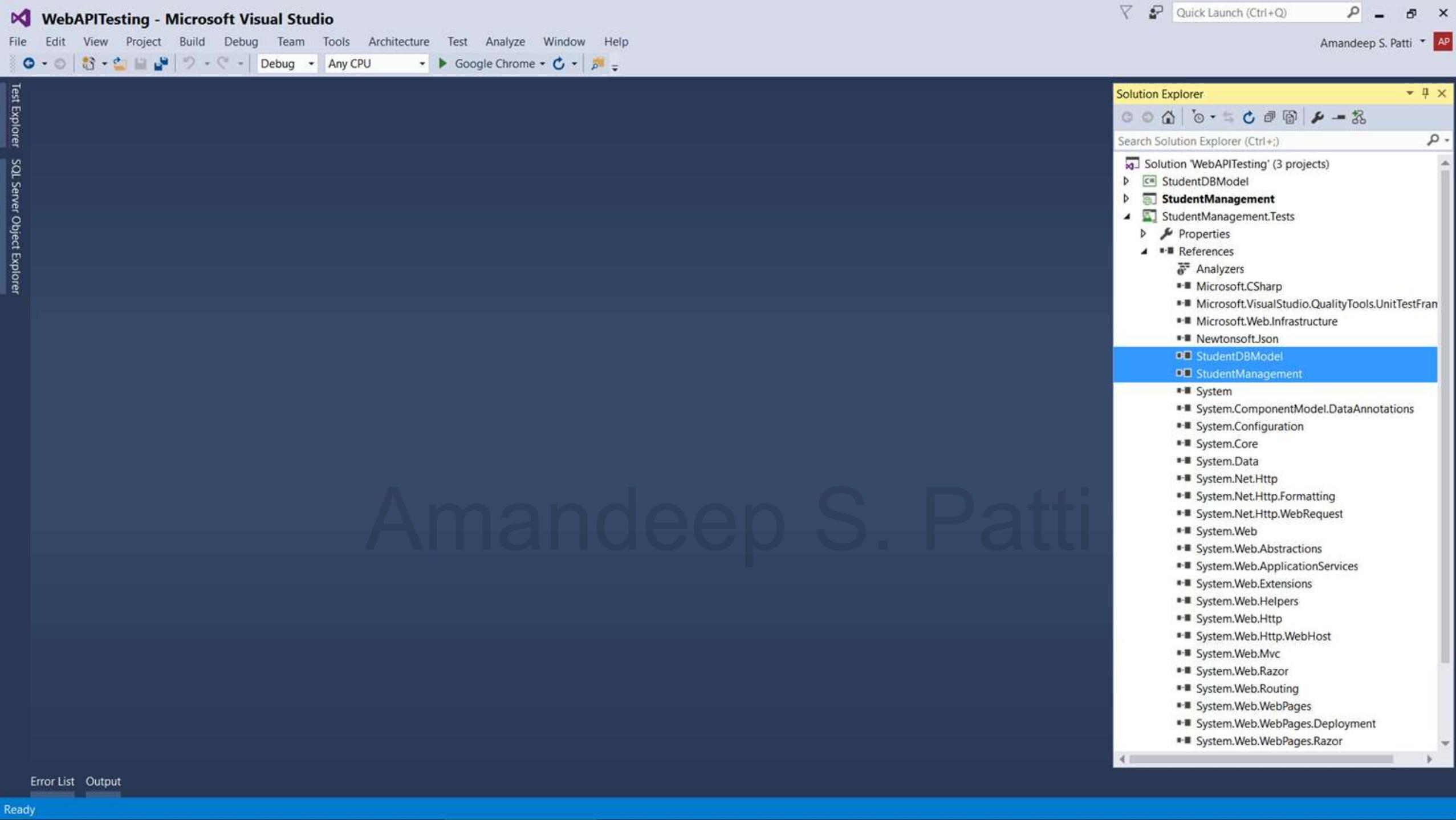
StudentDBModel

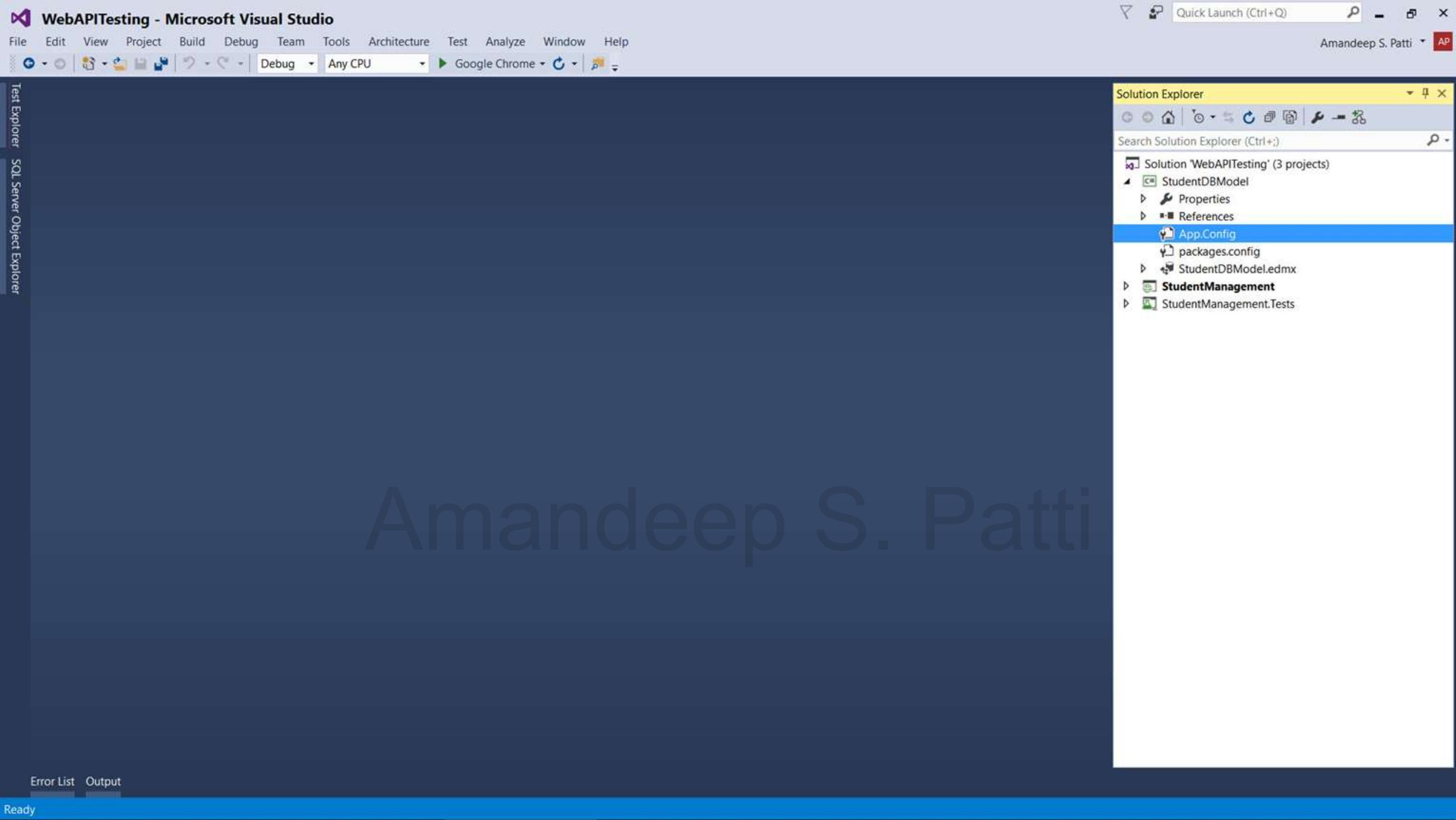
Browse...

OK

Cancel

# Amandeep S. Patti





WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team XML Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

App.Config

```
<?xml version="1.0" encoding="utf-8"?>
<configuration>
  <configSections>
    <!-- For more information on Entity Framework configuration, visit http://go.microsoft.com/fwlink/?LinkId=237493-->
    <section name="entityFramework" type="System.Data.Entity.Internal.ConfigFile.EntityFrameworkSection, EntityFramework, Version=6.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089" />
  </configSections>
  <connectionStrings>
    <add name="StudentDBEntities" connectionString="metadata=res://*/StudentDBModel.csdl|res://*/StudentDBModel.ssdl|res://*/StudentDBModel.msl;provider=System.Data.SqlClient;provider connection string="data source=DESKTOP-1D9C9F0\SQL2017;initial catalog=StudentDB;integrated security=True;multipleactiveresultsets=True;app=EntityDataSource"" providerName="System.Data.EntityClient" />
  </connectionStrings>
  <entityFramework>
    <defaultConnectionFactory type="Infrastructure.LocalDbConnectionFactory, EntityFramework" />
    <parameters>
      <parameter value="true" />
    </parameters>
    <defaultContainer>
      <provider invariantName="System.Data.SqlClient" type="System.Data.Entity.SqlServer.SqlProviderServices, EntityFramework.SqlServer" />
    </defaultContainer>
  </entityFramework>
</configuration>
```

Infrastructure.LocalDbConnectionFactory, EntityFramework

Copy

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
  - Properties
  - References
- App.Config
- packages.config
- StudentDBModel.edmx

StudentManagement

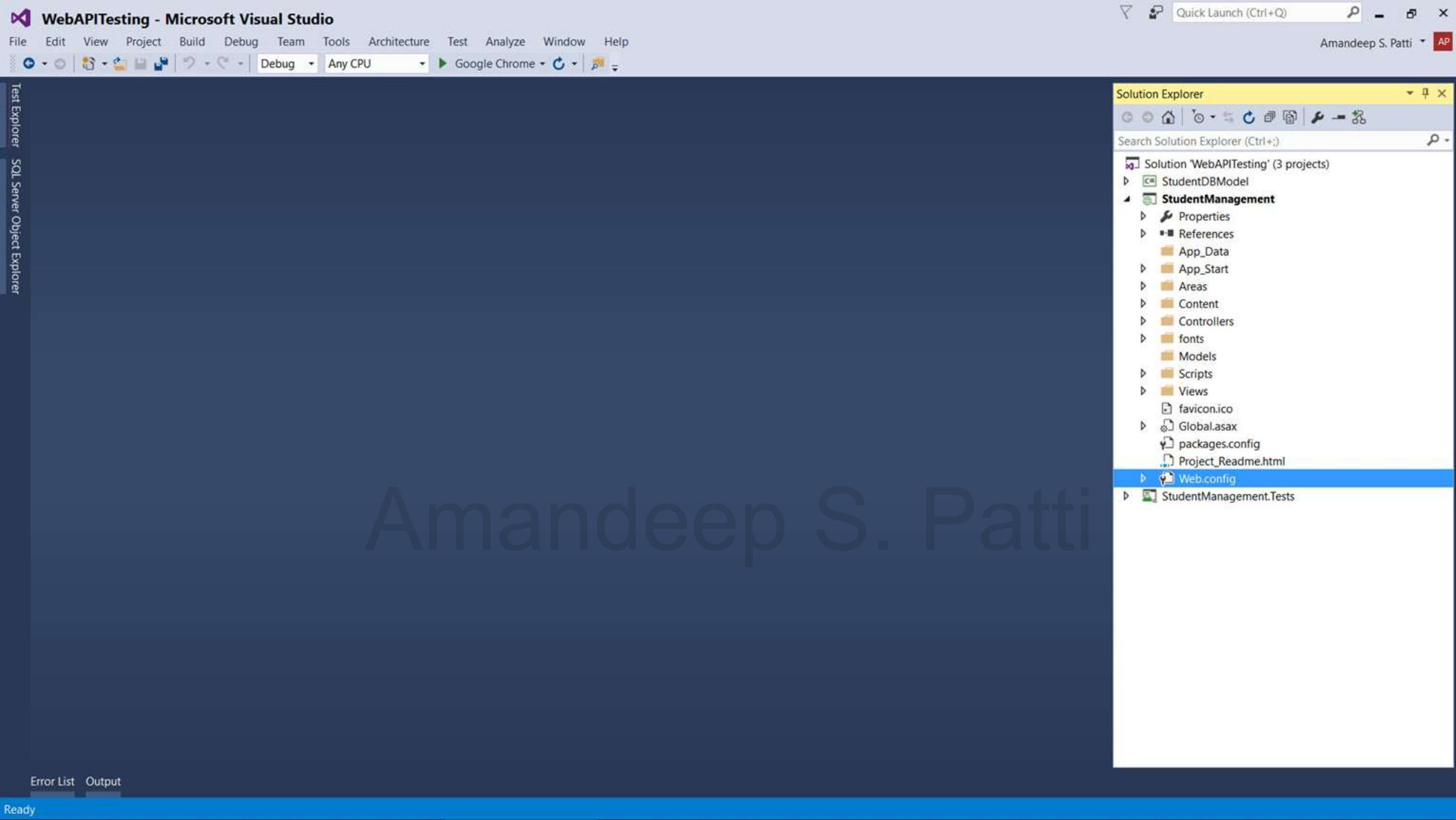
StudentManagement.Tests

Amandeep S. Patti

108 %

Error List Output

Ready Ln 9 Col 23 Ch 23 INS



WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team XML Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

Web.config\*

```
<?xml version="1.0" encoding="utf-8"?>
<!--
  For more information on how to configure your ASP.NET application, please visit
  http://go.microsoft.com/fwlink/?LinkId=301879
-->
<configuration>
  <appSettings>
    <add key="webpages:Version" value="3.0.0.0" />
    <add key="webpages:Enabled" value="false" />
    <add key="ClientValidationEnabled" value="true" />
    <add key="UnobtrusiveJavaScriptEnabled" value="true" />
  </appSettings>
  <system.web>
    <compilation debug="true" targetFramework="4.5.2" />
    <httpRuntime targetFramework="4.5.2" />
  </system.web>
```

Insert Snippet... Ctrl+K, Ctrl+X  
Surround With... Ctrl+K, Ctrl+S  
Go To Definition F12  
Breakpoint  
Run Flagged Threads To Cursor  
Cut Ctrl+X  
Copy Ctrl+C  
Paste Ctrl+V  
Outlining  
Properties  
<runtime>  
<assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">

Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'WebAPITesting' (3 projects) StudentDBModel StudentManagement Properties References App\_Data App\_Start Areas Content Controllers fonts Models Scripts Views favicon.ico Global.asax packages.config Project\_Readme.html Web.config StudentManagement.Tests

108 %

Error List Output

Ready Ln 18 Col 3 Ch 3 INS

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team XML Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

Web.config\*

```
<?xml version="1.0" encoding="utf-8"?>
<!--
  For more information on how to configure your ASP.NET application, please visit
  http://go.microsoft.com/fwlink/?LinkId=301879
-->
<configuration>
  <appSettings>
    <add key="webpages:Version" value="3.0.0.0" />
    <add key="webpages:Enabled" value="false" />
    <add key="ClientValidationEnabled" value="true" />
    <add key="UnobtrusiveJavaScriptEnabled" value="true" />
  </appSettings>
  <system.web>
    <compilation debug="true" targetFramework="4.5.2" />
    <httpRuntime targetFramework="4.5.2" />
  </system.web>

  <connectionStrings>
    <add name="StudentDBEntities" connectionString="metadata=res://*/StudentDBModel.csdl|res://*/StudentDBModel.ssdl|res://*/StudentDBModel.msl" providerName="System.Data.EntityClient" />
  </connectionStrings>

  <system.webServer>
    <handlers>
      <remove name="ExtensionlessUrlHandler-Integrated-4.0" />
      <remove name="OPTIONSVerbHandler" />
      <remove name="TRACEVerbHandler" />
      <add name="ExtensionlessUrlHandler-Integrated-4.0" path="*.*" verb="*" type="System.Web.Handlers.TransferRequestHandler" preCondition="integratedMode,runtimeVersionv4.0" />
    </handlers>
  </system.webServer>
</configuration>
```

Solution Explorer

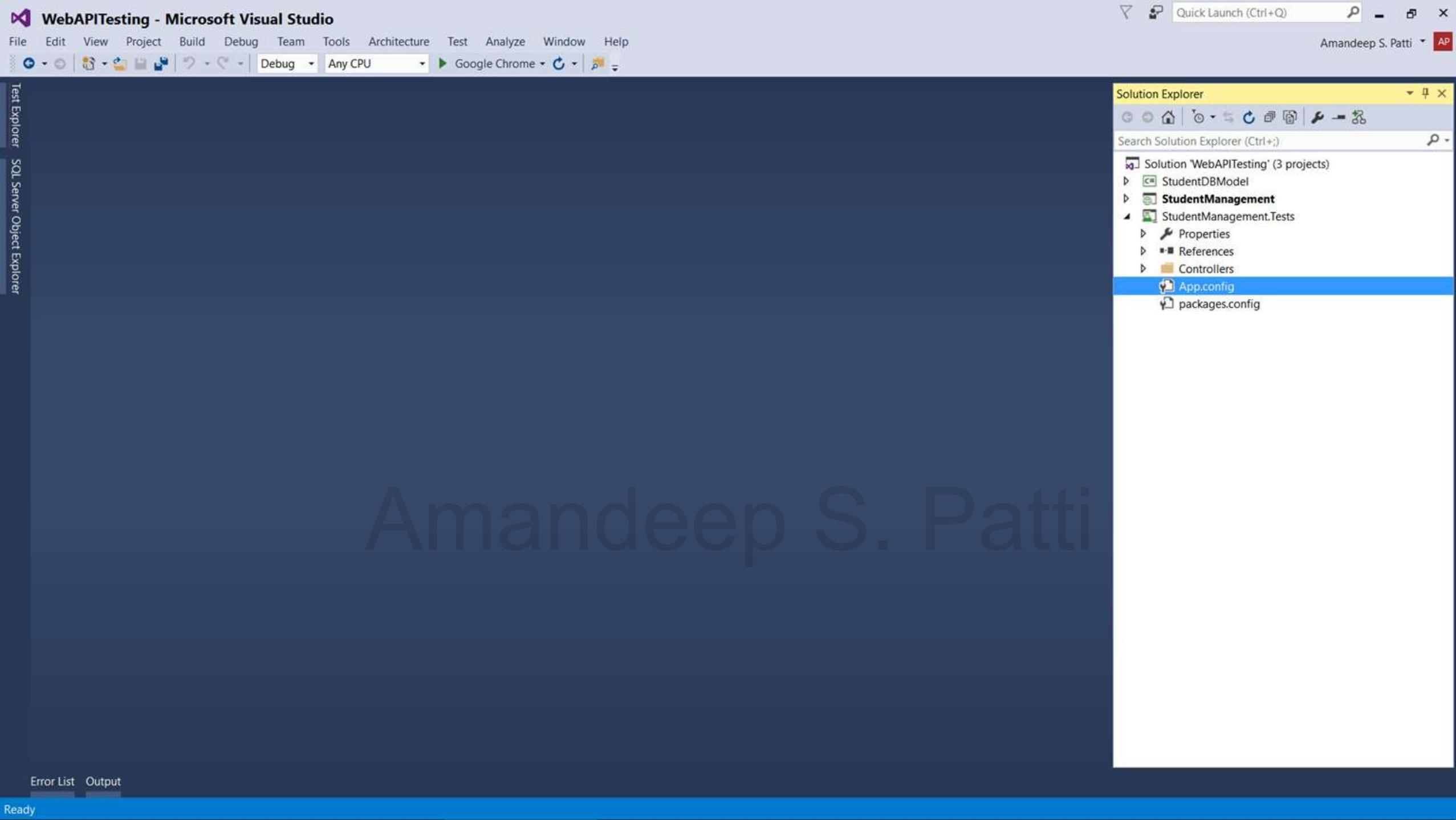
Search Solution Explorer (Ctrl+Shift+F)

- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement
    - Properties
    - References
    - App\_Data
    - App\_Start
    - Areas
    - Content
    - Controllers
    - fonts
    - Models
    - Scripts
    - Views
      - favicon.ico
      - Global.asax
      - packages.config
      - Project\_Readme.html
  - StudentManagement.Tests

108 %

Error List Output

Ready Ln 18 Col 1 Ch 1 INS



WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team XML Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

App.config

```
<?xml version="1.0" encoding="utf-8" ?>
<!--
    Note: Add entries to the App.config file for configuration settings
    that apply only to the Test project.
-->
<configuration>
    <appSettings>

        </appSettings>

        <connectionStrings>
            ...
        </connectionStrings>
    </configuration>
```

Insert Snippet... Ctrl+K, Ctrl+X  
Surround With... Ctrl+K, Ctrl+S  
Go To Definition F12  
Breakpoint  
Run Flagged Threads To Cursor  
Cut Ctrl+X  
Copy Ctrl+C  
Paste Ctrl+V  
Outlining  
Properties

Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'WebAPITesting' (3 projects) StudentDBModel StudentManagement StudentManagement.Tests Properties References Controllers App.config packages.config

108 %

Error List Output

Ready Ln 13 Col 25 Ch 25 INS

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team XML Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

App.config\* x

```
<?xml version="1.0" encoding="utf-8" ?>
<!--
    Note: Add entries to the App.config file for configuration settings
    that apply only to the Test project.
-->
<configuration>
    <appSettings>

        </appSettings>

        <connectionStrings>
            <add name="StudentDBEntities" connectionString="metadata=res://*/StudentDBModel.csdl|res://*/StudentDBModel.ssdl|res://*/StudentDBModel.msl" providerName="System.Data.EntityClient" />
        </connectionStrings>
    </configuration>
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

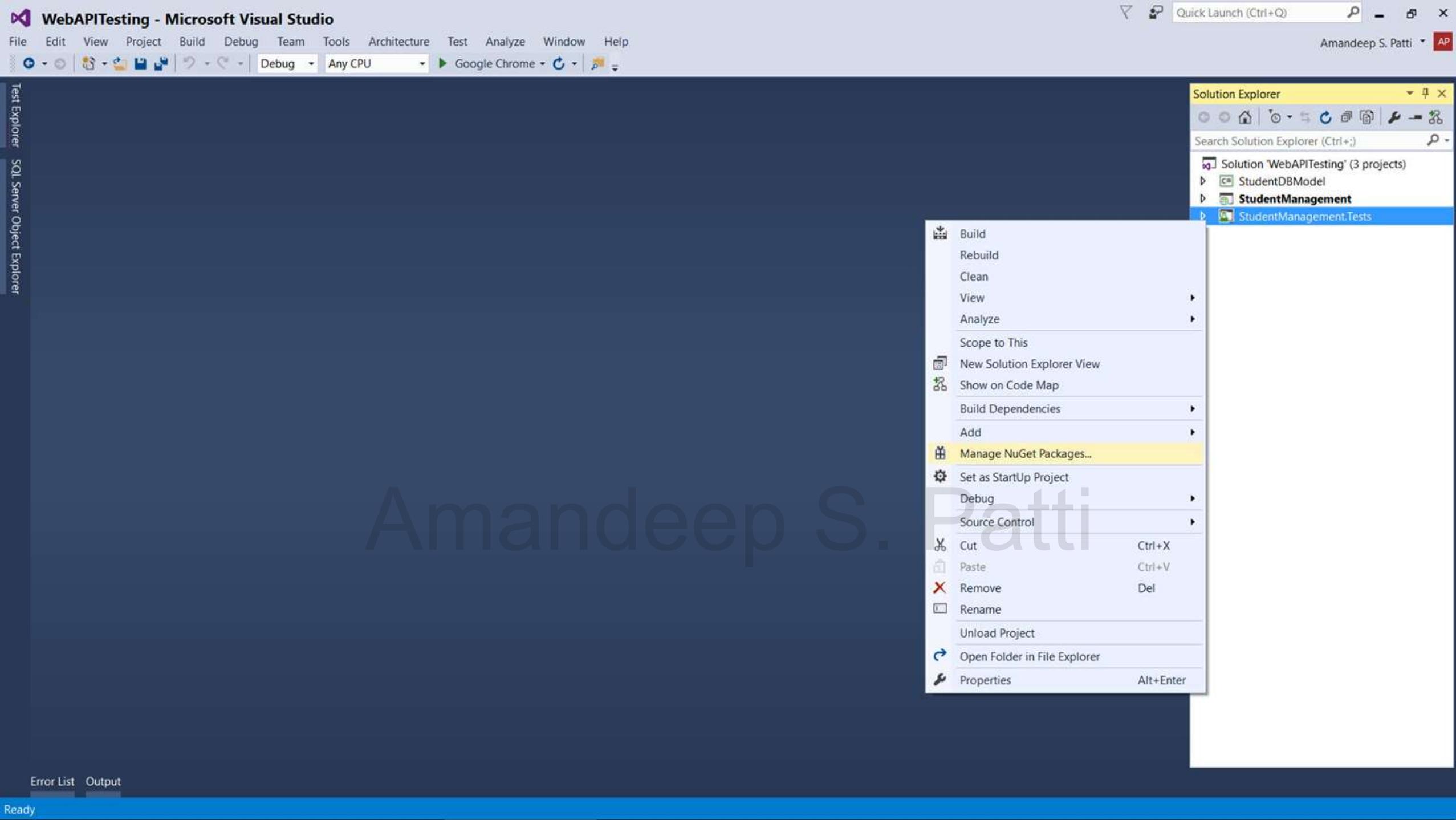
- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement
  - StudentManagement.Tests
    - Properties
    - References
    - Controllers
    - App.config
    - packages.config

108 %

Error List Output

Ready Ln 11 Col 1 Ch 1 INS

The screenshot shows the Microsoft Visual Studio interface with the 'WebAPITesting' project open. The 'App.config' file is displayed in the main editor window. The connection string section, specifically the 'connectionStrings' node, is highlighted with a blue selection bar. In the Solution Explorer on the right, the 'StudentManagement.Tests' project is expanded, showing its contents: Properties, References, Controllers, and the selected 'App.config' file. The status bar at the bottom indicates the current zoom level is 108%, and there are tabs for Error List, Output, and the current document.



WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

NuGet: StudentManagement.Tests

NuGet Package Manager: StudentManagement.Tests

Browse Installed Updates 1

Search (Ctrl+E)   Include prerelease

Package source: nuget.org

**.NET EntityFramework** by Microsoft, 16.4M downloads v6.1.3

Entity Framework is Microsoft's recommended data access technology for new applications.

**Newtonsoft.Json** 25.3M downloads v6.0.4

Json.NET is a popular high-performance JSON framework for .NET

**bootstrap** 4.41M downloads v8.0.2

Bootstrap framework in CSS. Includes fonts and JavaScript

**jQuery** 19.3M downloads v3.3.6

jQuery is a new kind of JavaScript Library.

jQuery is a fast and concise JavaScript Library that simplifies HTML document traversing, event handling...

**.NET Microsoft.AspNet.Mvc** by Microsoft, 15M downloads v2.2.1

This package contains the runtime assemblies for ASP.NET MVC.

**WebGrease** by webgrease@microsoft.com, 8.07M downloads v5.2.3

Web Grease is a suite of tools for optimizing javascript, css files and images.

**.NET Microsoft.Net.Http** by Microsoft, 9.51M downloads v1.6.0

This package provides a programming interface for modern HTTP/REST based applications.

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

Do not show this again

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement
- StudentManagement.Tests

Error List Output

Ready

## Preview



### Review Changes

Visual Studio is about to make changes to this solution. Click OK to proceed with the changes listed below.

StudentManagement.Tests

**Installing:**

EntityFramework.6.1.3

Amandeep S. Patti



Do not show this again

OK

Cancel

## License Acceptance



### License Acceptance

The following package(s) require that you accept their license terms before installing.

**EntityFramework** Author(s): Microsoft

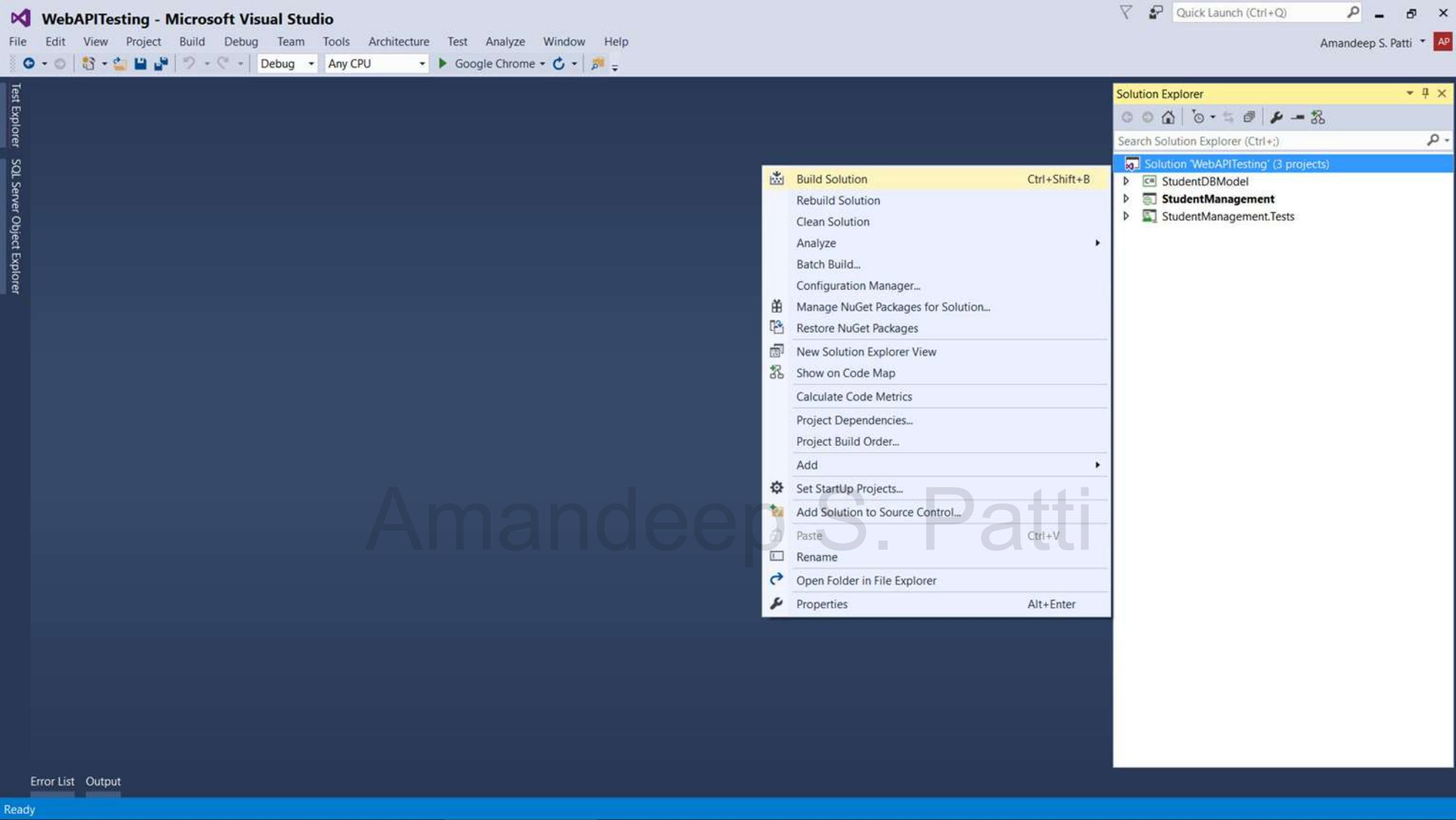
[View License](#)

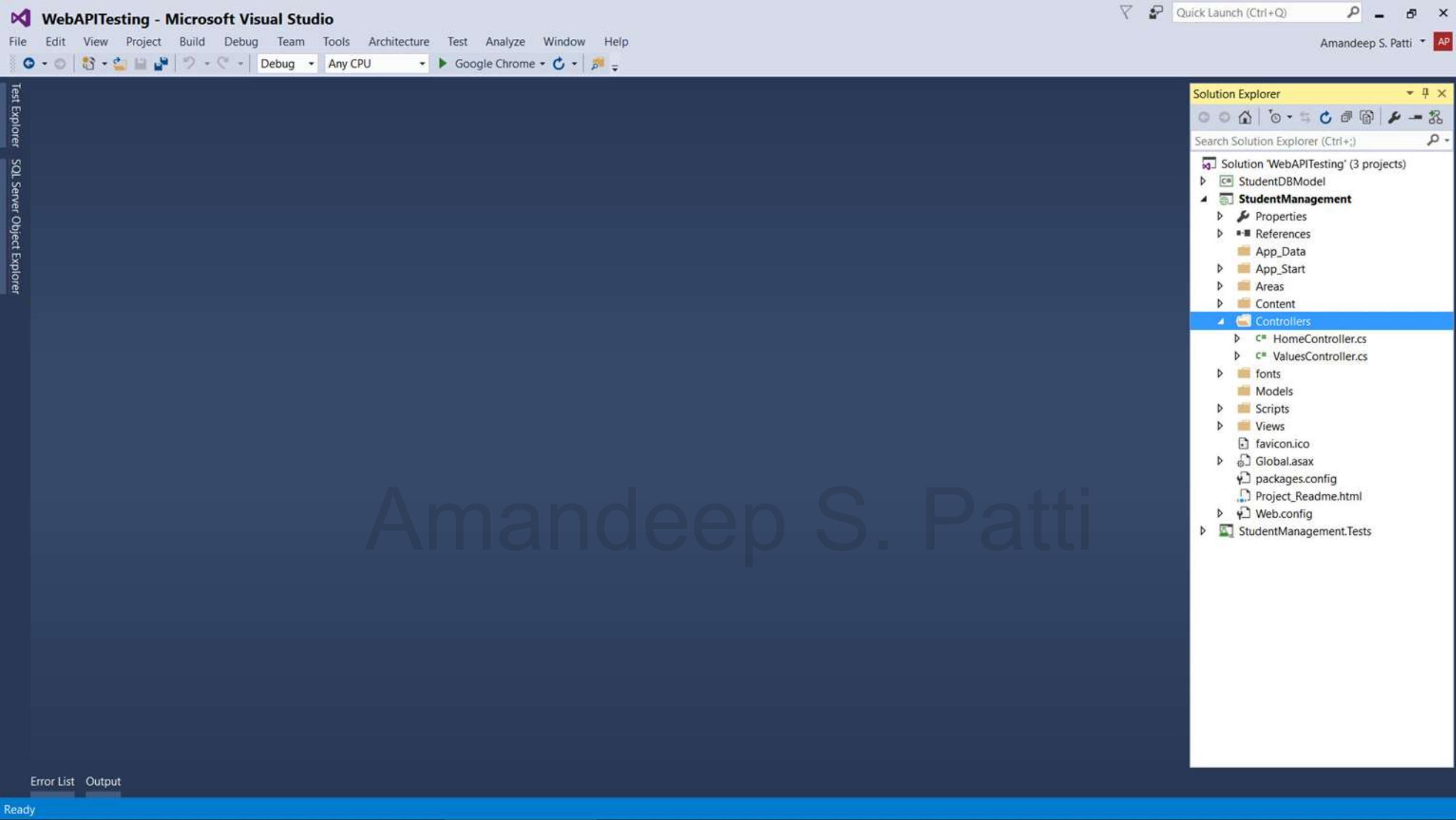
Amandeep S. Patti

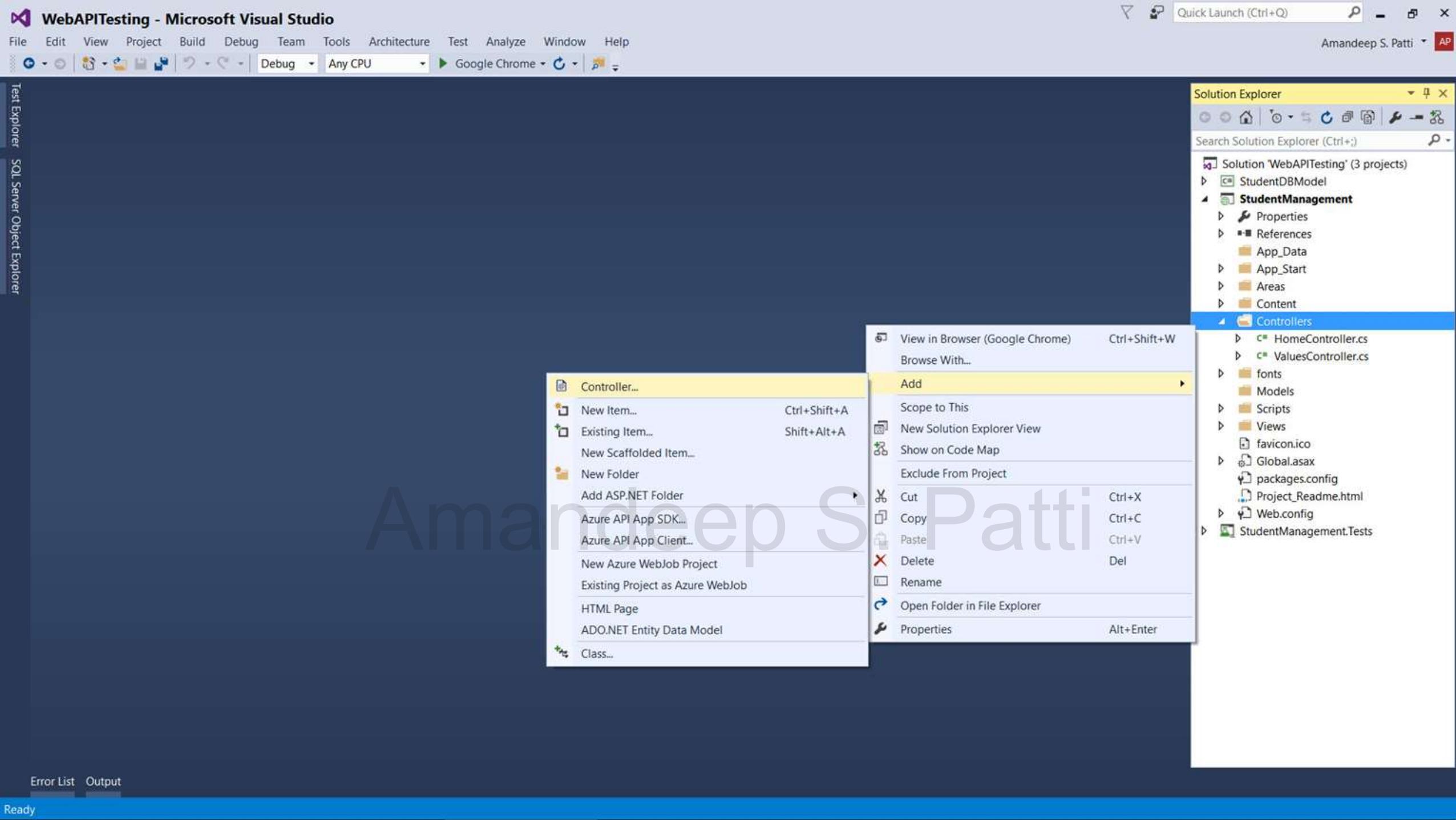
By clicking "I Accept," you agree to the license terms for the package(s) listed above. If you do not agree to the license terms, click "I Decline."

I Accept

I Decline







## Add Scaffold



Installed

Common  
Controller



MVC 5 Controller - Empty



MVC 5 Controller with read/write actions



MVC 5 Controller with views, using Entity Framework



Web API 2 Controller - Empty



Web API 2 Controller with actions, using Entity Framework



Web API 2 Controller with read/write actions



Web API 2 OData v3 Controller with actions, using Entity Framework



Web API 2 OData v3 Controller with read/write actions

Web API 2 Controller with actions, using Entity Framework

by Microsoft  
v2.0.0.0

A Web API controller with REST actions to create, read, update, delete, and list entities from an Entity Framework data context.

Id: ApiControllerWithContextScaffolder

[Click here to go online and find more scaffolding extensions.](#)

Add

Cancel

Amandeep S. Patti

X

## Add Controller

Model class:

Student (StudentDBModel)



Data context class:

StudentDBEntities (StudentDBModel)



Use async controller actions

Controller name:

StudentsController

Add

Cancel

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

StudentsController.cs

StudentManagement

StudentManagement.Controllers.StudentsController

db

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Entity;
using System.Data.Entity.Infrastructure;
using System.Linq;
using System.Net;
using System.Net.Http;
using System.Web.Http;
using System.Web.Http.Description;
using StudentDBModel;

namespace StudentManagement.Controllers
{
    public class StudentsController : ApiController
    {
        private StudentDBEntities db = new StudentDBEntities();

        // GET: api/Students
        public IQueryable<Student> GetStudents()...

        // GET: api/Students/5
        [ResponseType(typeof(Student))]
        public IHttpActionResult GetStudent(int id)... 

        // PUT: api/Students/5
        [ResponseType(typeof(void))]
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement**
    - Properties
    - References
    - App\_Data
    - App\_Start
    - Areas
    - Content
    - Controllers
      - HomeController.cs
      - StudentsController.cs**
      - ValuesController.cs
    - fonts
    - Models
    - Scripts
    - Views
      - favicon.ico
      - Global.asax
      - packages.config
      - Project\_Readme.html
      - Web.config
  - StudentManagement.Tests

Test Explorer

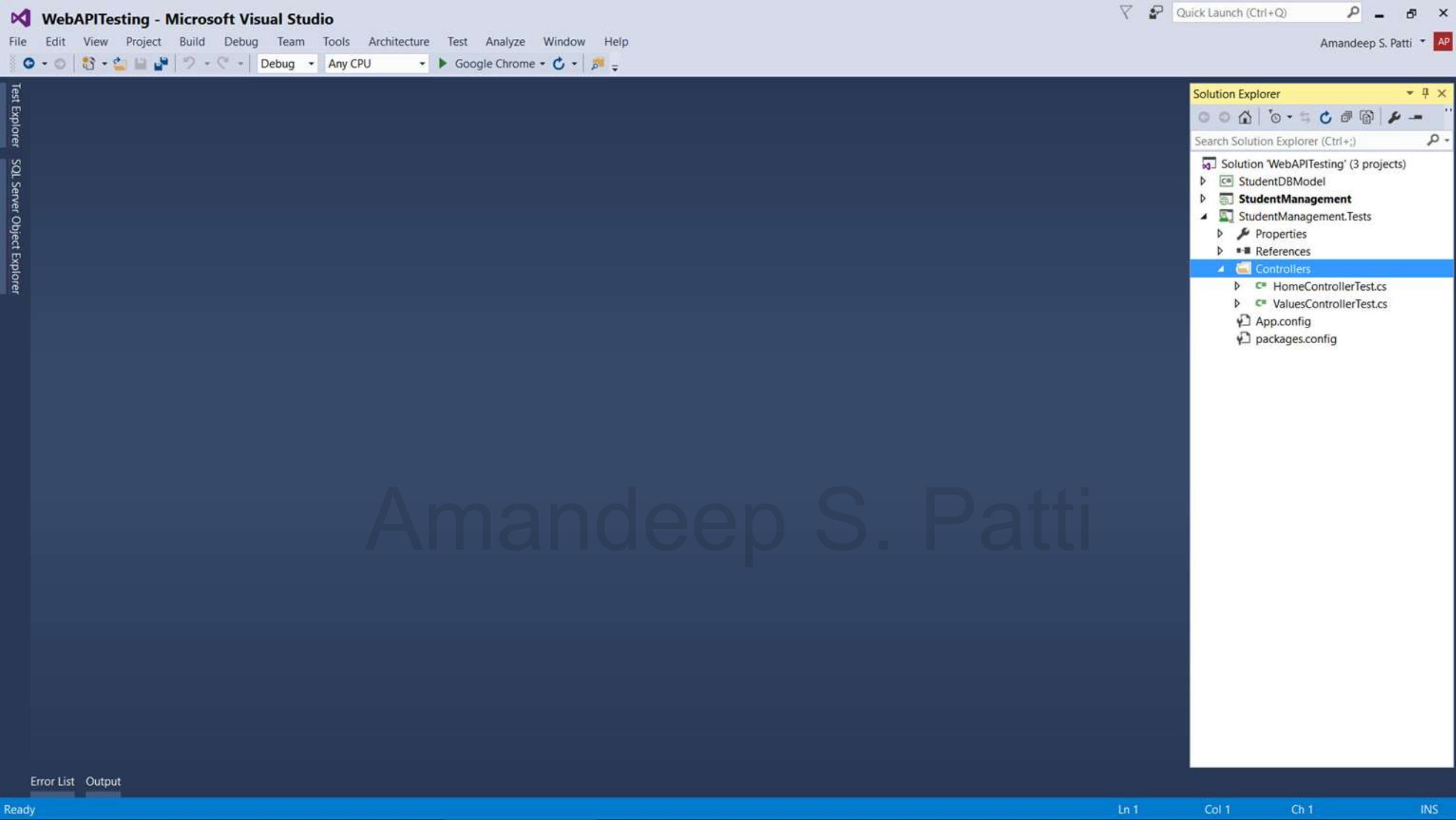
SQL Server Object Explorer

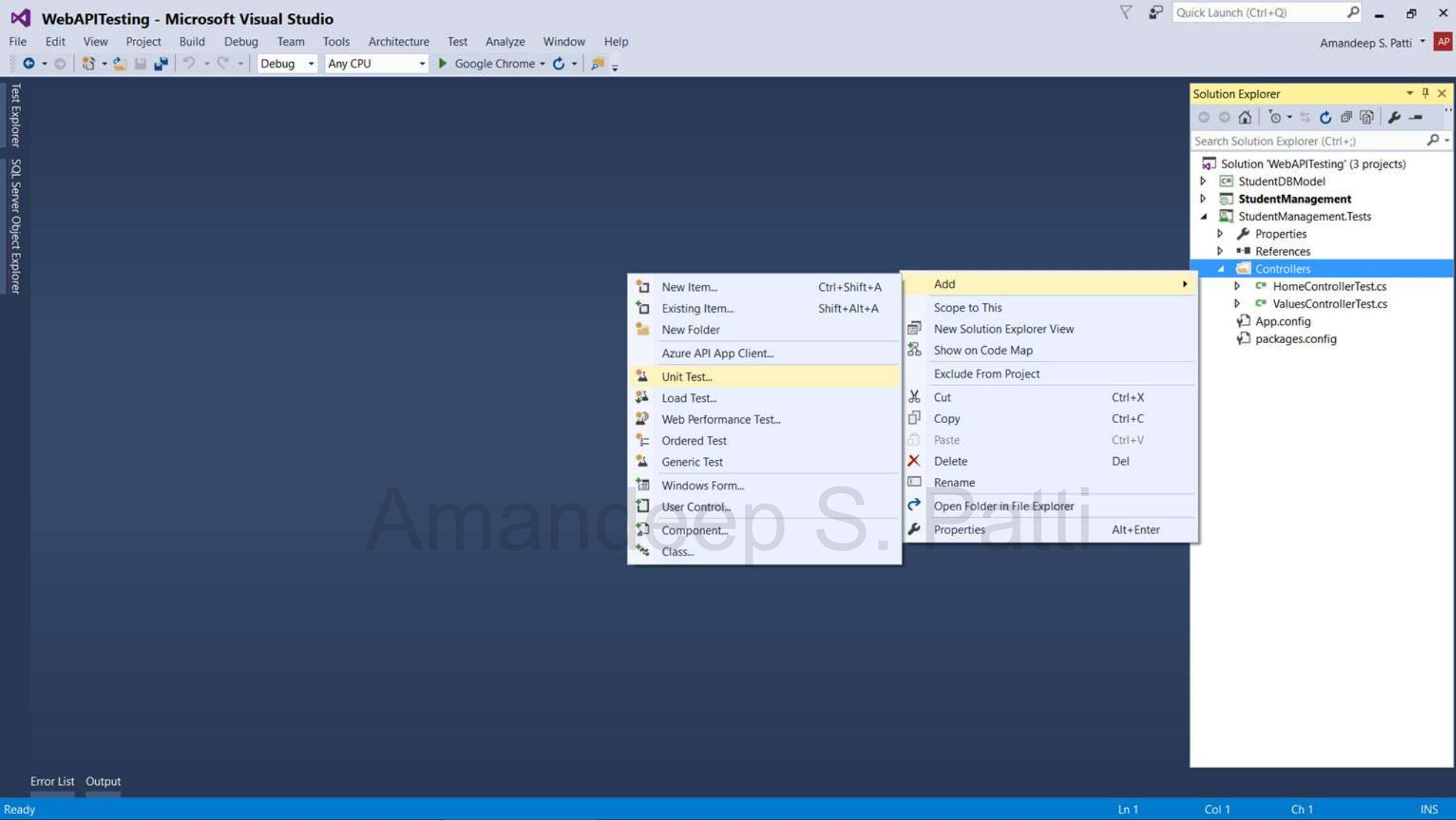
108 %

Error List Output

Ready Ln 1 Col 1 Ch 1 INS







WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

UnitTest1.cs

StudentManagement.Tests

StudentManagement.Tests.Controllers.UnitTesting

TestMethod1()

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;

namespace StudentManagement.Tests.Controllers
{
    [TestClass]
    public class UnitTest1
    {
        [TestMethod]
        public void TestMethod1()
        {
        }
    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - UnitTest1.cs
    - ValuesControllerTest.cs
  - App.config
  - packages.config

108 %

Error List Output

Ready Ln 1 Col 1 Ch 1 INS

# Amandeep S. Patti

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

UnitTest1.cs

```
StudentManagement.Tests
StudentManagement.Tests.Controllers.UnitTest1
TestMethod1()
```

Test Explorer

SQL Server Object Explorer

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - UnitTest1.cs
    - ValuesControllerTest.cs
  - App.config
  - packages.config

Open

Open With...

View Code F7

View Class Diagram

Scope to This

New Solution Explorer View

Show on Code Map

Exclude From Project

Cut Ctrl+X

Copy Ctrl+C

Delete Del

Rename

Properties Alt+Enter

108 %

Error List Output

Ready Ln 1 Col 1 Ch 1 INS

## Microsoft Visual Studio



You are renaming a file. Would you also like to perform a rename in this project of all references to the code element 'UnitTest1'?

Yes

No

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome | Solution Explorer | Test Explorer | SQL Server Object Explorer

StudentManagement.Tests

StudentManagement.Tests.Controllers.StudentsControllerTest

TestMethod1()

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;

namespace StudentManagement.Tests.Controllers
{
    [TestClass]
    public class StudentsControllerTest
    {
        [TestMethod]
        public void TestMethod1()
        {
        }
    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - StudentsControllerTest.cs
    - ValuesControllerTest.cs
  - App.config
  - packages.config

Amandeep S. Patti

108 %

Error List Output

Ready Ln 2 Col 1 Ch 1 INS

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome | TestMethod1()

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;

using StudentManagement.Controllers;
using StudentDBModel;

using System.Web.Http.Results;

namespace StudentManagement.Tests.Controllers
{
    [TestClass]
    public class StudentsControllerTest
    {
        [TestMethod]
        public void TestMethod1()
        {
        }
    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement**
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - StudentsControllerTest.cs**
    - ValuesControllerTest.cs
  - App.config
  - packages.config

Amandeep S. Patti

108 %

Error List Output

Ready Ln 7 Col 31 Ch 31 INS

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome

Test Explorer SQL Server Object Explorer

StudentManagement.Tests StudentManagement.Tests.Controllers.StudentsControllerTest \_sID

```
using StudentManagement.Controllers;
using StudentDBModel;

using System.Web.Http.Results;

namespace StudentManagement.Tests.Controllers
{
    [TestClass]
    public class StudentsControllerTest
    {
        private static int _sID { get; set; }

    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement**
  - StudentManagement.Tests
    - Properties
    - References
    - Controllers
      - HomeControllerTest.cs
      - StudentsControllerTest.cs**
      - ValuesControllerTest.cs
    - App.config
    - packages.config

Amandeep S. Patti

108 %

Error List Output

Ready Ln 14 Col 1 Ch 1 INS

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome | Add\_Test()

[TestClass]

public class StudentsControllerTest

{

    private static int \_sID { get; set; }

    [TestMethod]

    public void Add\_Test()

    {

        //Arrange

        StudentsController sc = new StudentsController();

        Student s = new Student()

        {

            FirstName = "Amandeep",

            LastName = "Patti",

            RegistrationNumber = "R11"

        };

        //Act

        var result = sc.PostStudent(s) as CreatedAtRouteNegotiatedContentResult<Student>;

        //Assert

        Assert.AreEqual("Amandeep", result.Content.FirstName);

        \_sID = result.Content.Id;

    }

}

108 %

Error List Output

Ready Ln 34 Col 10 Ch 10 INS

Solution Explorer

Search Solution Explorer (Ctrl+.)

Solution 'WebAPITesting' (3 projects)

StudentDBModel

**StudentManagement**

StudentManagement.Tests

Properties

References

Controllers

HomeControllerTest.cs

StudentsControllerTest.cs

ValuesControllerTest.cs

App.config

packages.config

A large watermark "Amandeep S. Patti" is overlaid across the center of the screen.

```
public class StudentsControllerTest
{
    private static int _sID { get; set; }

    [TestMethod]
    public void Add_Test()
    {
        //Arrange
        StudentsController sc = new StudentsController();
        Student s = new Student()
        {
            FirstName = "Amandeep",
            LastName = "Patti",
            RegistrationNumber = "R11"
        };
        //Act
        var result = sc.PostStudent(s) as CreatedAtRouteNegotiatedContentResult<Student>;
        //Assert
        Assert.AreEqual("Amandeep", result.Content.FirstName);
        _sID = result.Content.Id;
    }
}
```

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

StudentsControllerTest.cs\* | StudentManagement.Tests | StudentManagement.Tests.Controllers.StudentsControllerTest | Detail\_Test()

```
public class StudentsControllerTest
{
    private static int _sID { get; set; }

    [TestMethod]
    public void Add_Test()...
```

```
[TestMethod]
public void Detail_Test()
{
    //Arrange
    StudentsController sc = new StudentsController();

    //Act
    var result = sc.GetStudent(_sID) as OkNegotiatedContentResult<Student>;
    Assert.AreEqual("Amandeep", result.Content.FirstName);
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement
  - StudentManagement.Tests
    - Properties
    - References
    - Controllers
      - HomeControllerTest.cs
      - StudentsControllerTest.cs
      - ValuesControllerTest.cs
    - App.config
    - packages.config

108 %

Error List Output

Ready Ln 47 Col 10 Ch 10 INS

The screenshot shows the Microsoft Visual Studio IDE interface. The main window displays the code for a unit test named 'StudentsControllerTest'. The code follows a standard TDD pattern with three sections: Arrange, Act, and Assert. The 'Arrange' section creates a new instance of the 'StudentsController'. The 'Act' section calls the 'GetStudent' method on the controller, casting the result to an 'OkNegotiatedContentResult<Student>'. The 'Assert' section then checks if the student's first name is 'Amandeep' using the 'Assert.AreEqual' method. The 'Detail\_Test()' method is highlighted in blue, indicating it is the current active test. The 'Solution Explorer' pane on the right shows the project structure for 'WebAPITesting' with three projects: 'StudentDBModel', 'StudentManagement', and 'StudentManagement.Tests'. The 'HomeControllerTest.cs', 'StudentsControllerTest.cs', and 'ValuesControllerTest.cs' files under 'StudentManagement.Tests' are listed. The 'App.config' and 'packages.config' files are also shown. The status bar at the bottom indicates the current zoom level is 108%, and there are tabs for 'Error List' and 'Output'.

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome

Test Explorer SQL Server Object Explorer

StudentManagement.Tests References

```
public class StudentsControllerTest
{
    private static int _sID { get; set; }

    [TestMethod]
    public void Add_Test()...
```

[TestMethod]

```
0 references
public void Detail_Test()...
```

[TestMethod]

```
0 references
public void Delete_Test()
{
    //Arrange
    StudentsController sc = new StudentsController();

    //Act
    var result = sc.DeleteStudent(_sID) as OkNegotiatedContentResult<Student>

    //Assert
    Assert.AreEqual("Amandeep", result.Content.FirstName);
}
```

108 %

Error List Output

Ln 49 Col 1 Ch 1 INS

Solution Explorer

Search Solution Explorer (Ctrl+F)

- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement
  - StudentManagement.Tests
    - Properties
    - References
    - Controllers
      - HomeControllerTest.cs
      - StudentsControllerTest.cs
      - ValuesControllerTest.cs
    - App.config
    - packages.config

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer SQL Server Object Explorer

StudentsControllerTest.cs\* | Debug Any CPU | Google Chrome | Detail\_Test()

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;

using StudentManagement.Controllers;
using StudentDBModel;

using System.Web.Http.Results;

namespace StudentManagement.Tests.Controllers
{
    [TestClass]
    public class StudentsControllerTest
    {
        private static int _sID { get; set; }

        [TestMethod]
        public void Add_Test()
        {
        }

        [TestMethod]
        public void Detail_Test()
        {
        }

        [TestMethod]
        public void Delete_Test()
        {
    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+F)

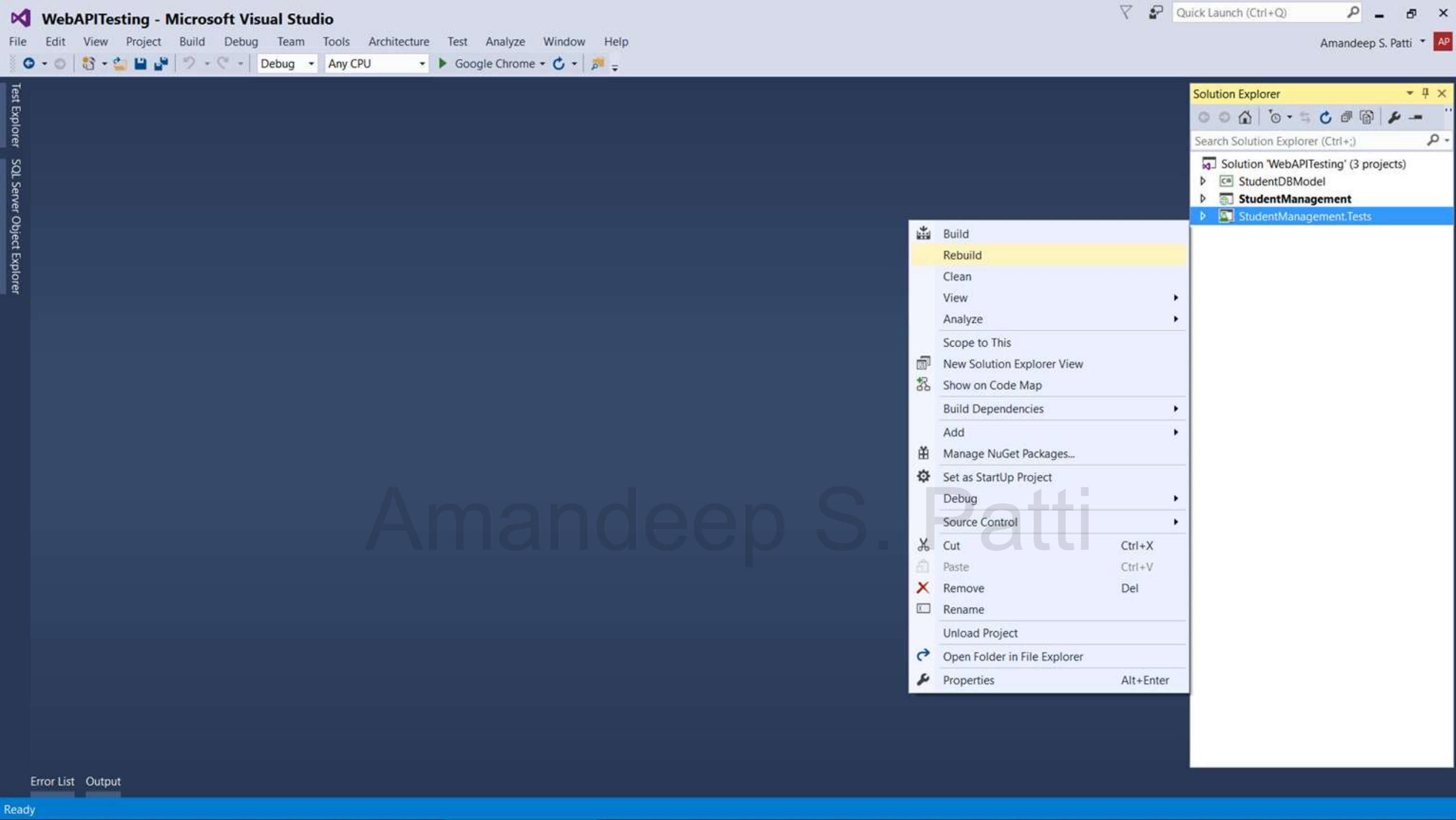
- Solution 'WebAPITesting' (3 projects)
  - StudentDBModel
  - StudentManagement**
  - StudentManagement.Tests
    - Properties
    - References
    - Controllers
      - HomeControllerTest.cs
      - StudentsControllerTest.cs**
      - ValuesControllerTest.cs
    - App.config
    - packages.config

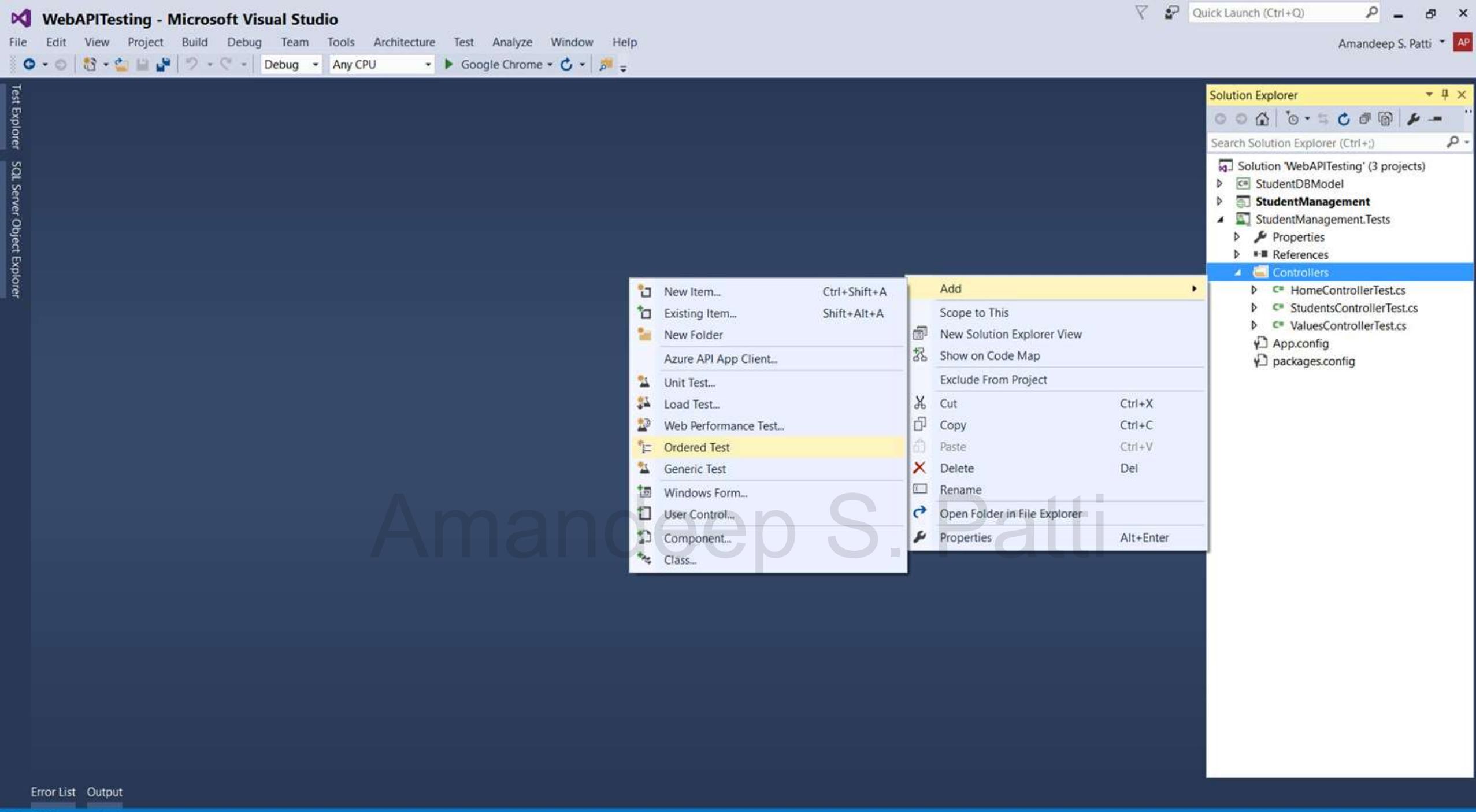
108 %

Error List Output

Ready Ln 63 Col 1 Ch 1 INS







WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer

SQL Server Object Explorer

OrderedTest1.orderedtest

0 test(s) added

Select project to view tests:

[All Loaded Tests]

Available tests:

Test Name	Project	ID
Add_Test	StudentManag	StudentManag
Delete	StudentManag	StudentManag
Delete_Test	StudentManag	StudentManag
Detail_Test	StudentManag	StudentManag
Get	StudentManag	StudentManag
GetById	StudentManag	StudentManag
Index	StudentManag	StudentManag
Post	StudentManag	StudentManag
Put	StudentManag	StudentManag

Selected tests:

Test Name	Project	ID
-----------	---------	----

▶◀

Continue after failure

Error List Output

Ready

Solution Explorer

Search Solution Explorer (Ctrl+F)

Solution 'WebAPITesting' (3 projects)

- StudentDBModel
- StudentManagement
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - OrderedTest1.orderedtest
    - StudentsControllerTest.cs
    - ValuesControllerTest.cs
  - App.config
  - packages.config

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer

SQL Server Object Explorer

OrderedTest1.orderedtest\* X

3 test(s) added

Select project to view tests:

[All Loaded Tests]

Available tests:

Test Name	Project	ID
Add_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Add
Delete	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Delete
Delete_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Delete
Detail_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Detail
Get	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Get
GetById	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.GetById
Index	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Index
Post	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Post
Put	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Put

Selected tests:

Test Name	Project	ID
Add_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Add
Detail_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Detail
Delete_Test	StudentMa...	StudentManagement.Tests.Controllers.StudentsControllerTest.Delete

Up ↑ ↓

Right > <

Continue after failure

Solution Explorer

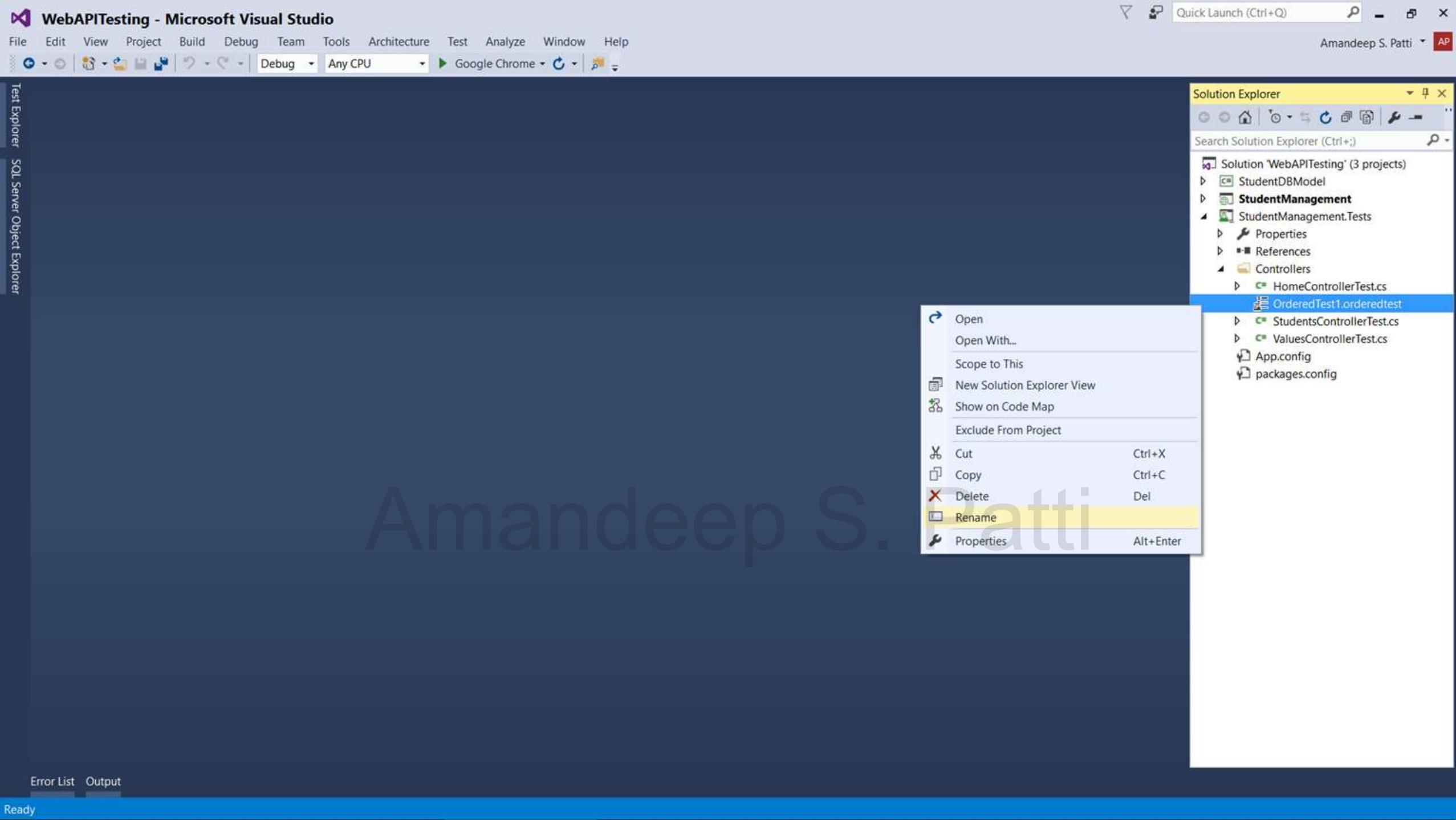
Search Solution Explorer (Ctrl+F)

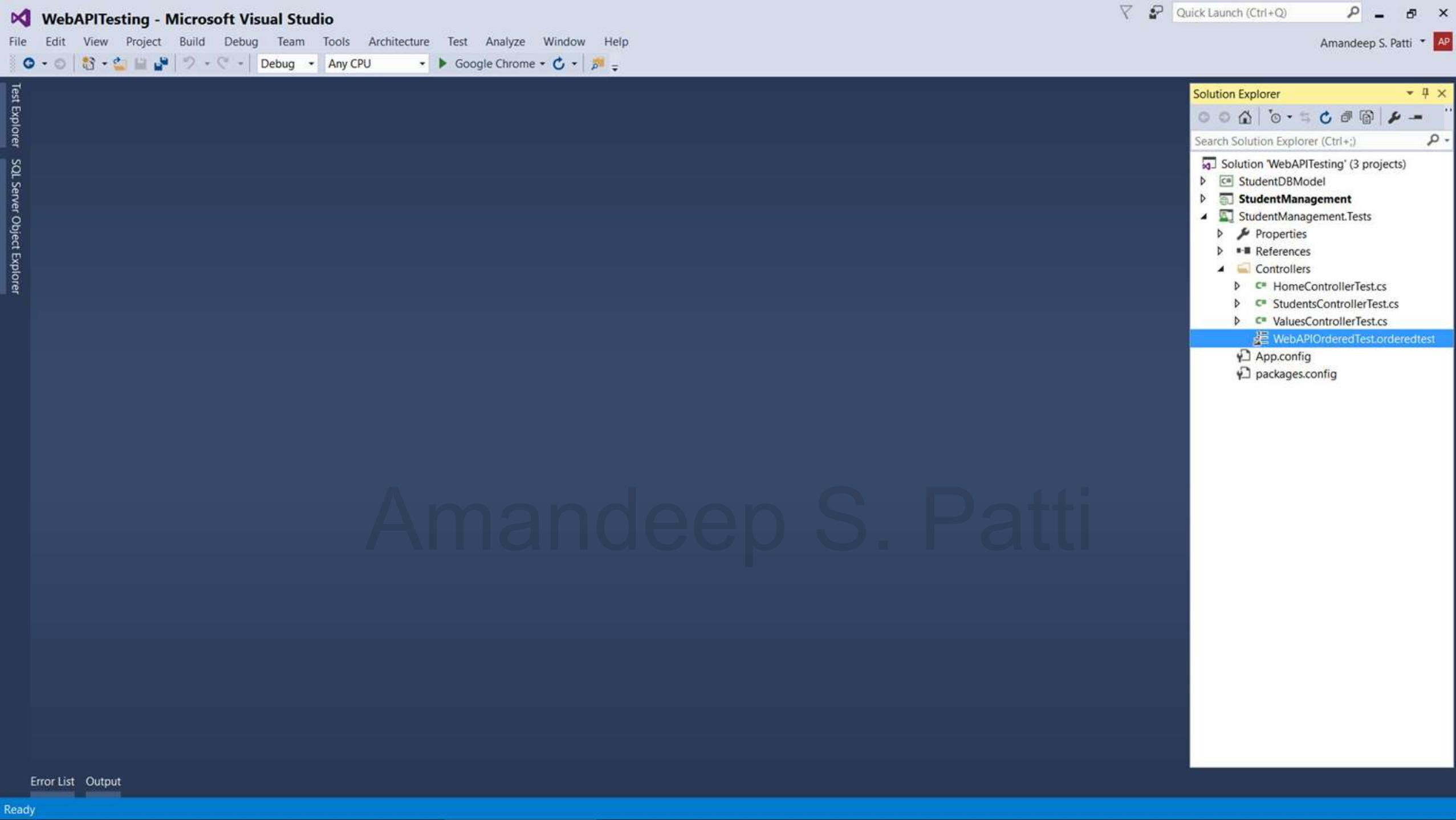
Solution 'WebAPITesting' (3 projects)

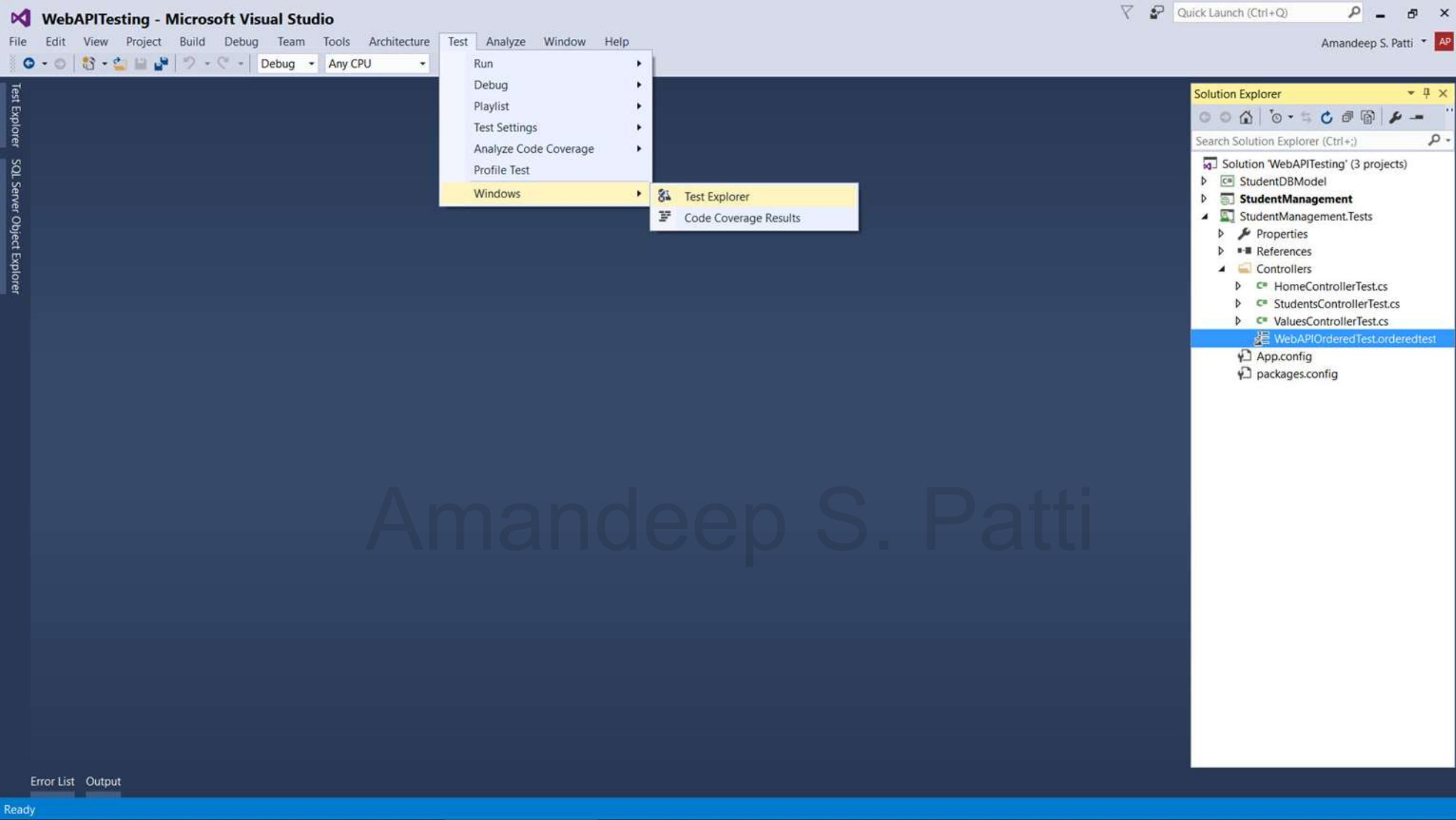
- StudentDBModel
- StudentManagement**
- StudentManagement.Tests
  - Properties
  - References
  - Controllers
    - HomeControllerTest.cs
    - OrderedTest1.orderedtest
    - StudentsControllerTest.cs
    - ValuesControllerTest.cs
  - App.config
  - packages.config

Error List Output

Ready







WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer | Search | Streaming Video: Configure continuous integration | Run All | Run... | Playlist: All Tests | Not Run Tests (10) | Add\_Test | Delete | Delete\_Test | Detail\_Test | Get | GetByld | Index | Post | Put | webapiorderedtest

Run Selected Tests | Debug Selected Tests | Analyze Code Coverage for Selected Tests | Profile Test | Group By | Add to Playlist | Copy (Ctrl+C) | Select All (Ctrl+A) | Open Test (F12)

Solution Explorer | Search Solution Explorer (Ctrl+F) | Solution 'WebAPITesting' (3 projects) | StudentDBModel | StudentManagement | StudentManagement.Tests | Properties | References | Controllers | HomeControllerTest.cs | StudentsControllerTest.cs | ValuesControllerTest.cs | WebAPIOrderedTest.orderedtest | App.config | packages.config

Error List Output

Ready

The screenshot displays the Microsoft Visual Studio interface for a project named "WebAPITesting". The Test Explorer window on the left shows a list of "Not Run Tests" (10 items) and a context menu is open over one of them, specifically "webapiorderedtest". The menu options include "Run Selected Tests", "Debug Selected Tests", "Analyze Code Coverage for Selected Tests", "Profile Test", "Group By", "Add to Playlist", "Copy (Ctrl+C)", "Select All (Ctrl+A)", and "Open Test (F12)". The Solution Explorer window on the right shows the solution structure with three projects: "StudentDBModel", "StudentManagement", and "StudentManagement.Tests". Under "StudentManagement.Tests", there are files for Home Controller, Student Controller, Value Controller, and a test file "WebAPIOrderedTest.orderedtest". The status bar at the bottom indicates "Ready".

WebAPITesting - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Quick Launch (Ctrl+Q)

Amandeep S. Patti AP

Test Explorer | Search | Streaming Video: Configure continuous integration | Run All | Run... | Playlist: All Tests | Passed Tests (1) | webapiorderedtest | 6 sec | Not Run Tests (9) | Add\_Test | Delete | Delete\_Test | Detail\_Test | Get | GetById | Index | Post | Put

Solution Explorer | Search Solution Explorer (Ctrl+) | Solution 'WebAPITesting' (3 projects) | StudentDBModel | StudentManagement | StudentManagement.Tests | Properties | References | Controllers | HomeControllerTest.cs | StudentsControllerTest.cs | ValuesControllerTest.cs | WebAPIOrderedTest.orderedtest | App.config | packages.config

Test Explorer

SQL Server Object Explorer

Test Explorer

Output

Error List

Ready

Ln 1 Col 1 Ch 1 INS