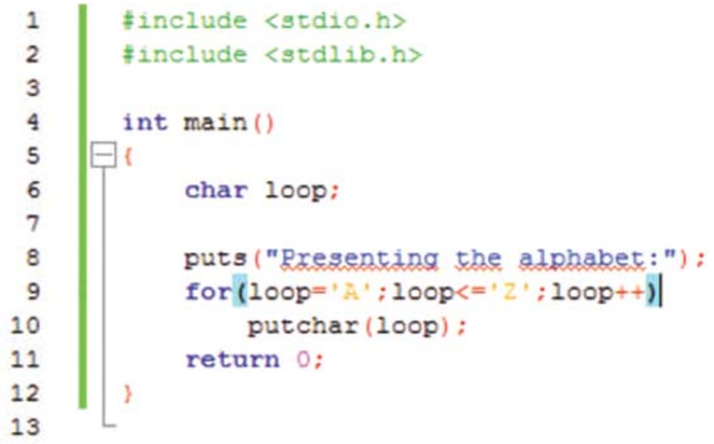
Computer Engineering

11

PRACTICAL MATERIAL

Computer Programming



```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    char loop;

    puts("Presenting the alphabet:");
    for(loop='A';loop<='Z';loop++)
        putchar(loop);
    return 0;
}
```

Government of Nepal
Ministry of Education, Science and Technology
Curriculum Development Centre
Sanothimi, Bhaktapur

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Technical and Vocational Stream

Practical Materials

Computer Programming

(Grade 11)

Secondary Level

Computer Engineering

Government of Nepal

Ministry of Education, Science and Technology

Curriculum Development Centre

Sanothimi, Bhaktapur

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Preface

The curriculum and curricular materials have been developed and revised on a regular basis with the aim of making education objective-oriented, practical, relevant and job oriented. It is necessary to instill the feelings of nationalism, national integrity and democratic spirit in students and equip them with morality, discipline and self-reliance, creativity and thoughtfulness. It is essential to develop in them the linguistic and mathematical skills, knowledge of science, information and communication technology, environment, health and population and life skills. It is also necessary to bring in them the feeling of preserving and promoting arts and aesthetics, humanistic norms, values and ideals. It has become the need of the present time to make them aware of respect for ethnicity, gender, disabilities, languages, religions, cultures, regional diversity, human rights and social values so as to make them capable of playing the role of responsible Citizens with applied technical and vocational knowledge and skills. This practical material for Computer Engineering has been developed in line with the Secondary Level Computer Engineering Curriculum so as to facilitate the students in their classroom based practicum and on the job training by incorporating the recommendations and feedback obtained from various schools, workshops and seminars, interaction programs attended by teachers, students and parents.

In Bringing out the practical material in this form, the contribution of the Director General of CDC Dr. Lekhnath Poudel and Pro, Dr. Subarna Shakya, Bibha Sthapit, Kumar Prasun, Anil Barma, Dr. Sanjiv Pandey, Romakanta Pandey, Dinesha Khatri, Trimandir Prajapati, Shankar Yadav, Jonsan Khadka and Ramesha Rimal is highly acknowledged. The book is written by Yogesh Parajuli and the subject matter of the book was edited by Badrinath Timalsina and Khilanath Dhamala. CDC extends sincere thanks to all those who have contributed to developing this practical book.

This book is a supplimentary practical material for students and teachers. In addition they have to make use of other relevnt materials to ensure all the learning outcomes set in the curriculum. The teachers, students and all other stakeholders are expected to make constructive comments and suggestions to make it a more useful practical material.

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Table of Contents

Unit - 1

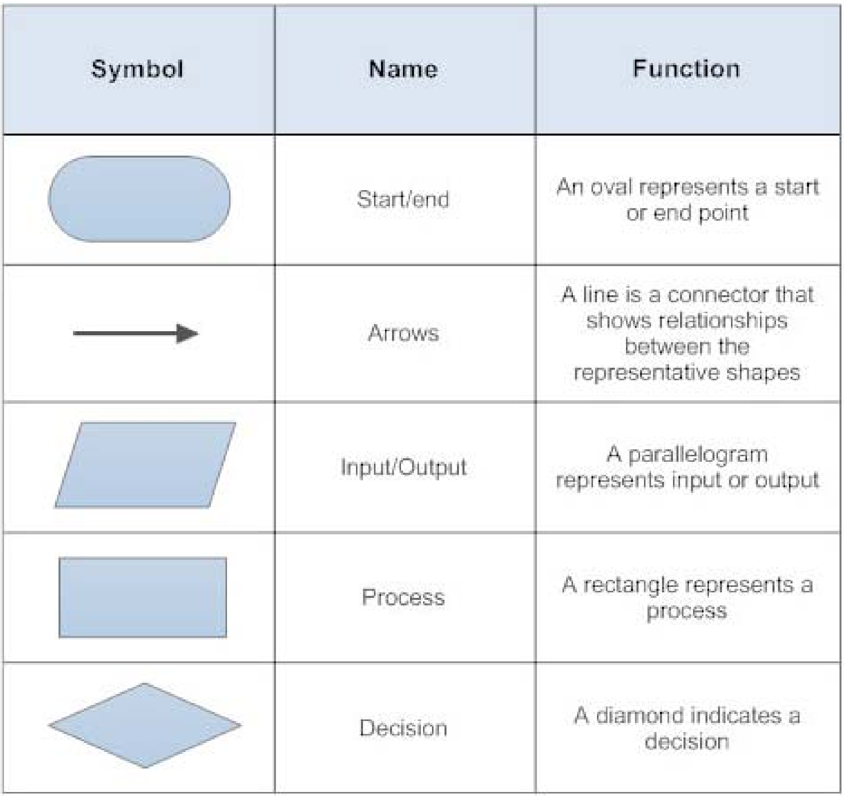
Develop a flowchart, algorithm and Pseudo code with the concept of sequence

Iteration, loops

- We learned theoritical aspects of flowcharts algorithm and pseudo code in the earlier lesson.
- We will learn and practice the practical aspects of these contents in this unit.

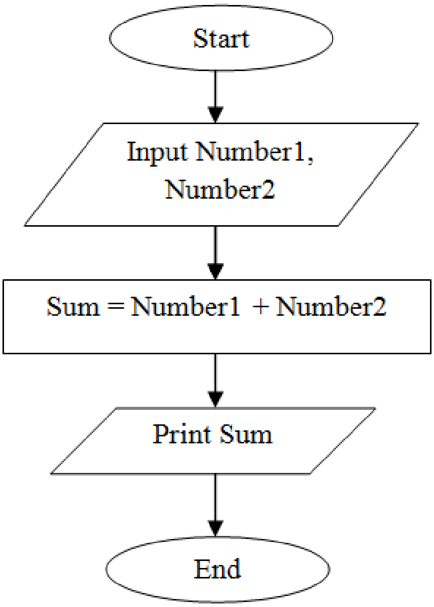
Flowchart

- The graphical representation of flow of program is a flowchart
- The symbols to draw flowchart are as follows:



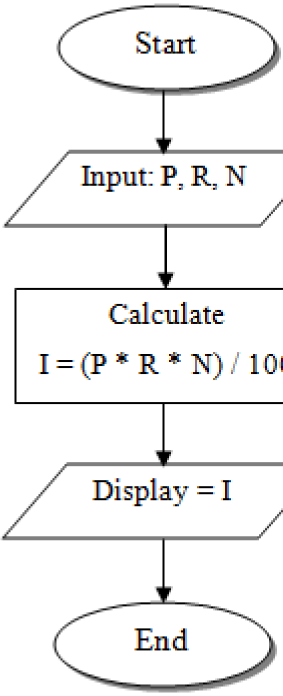
Symbol	Name	Function
⬭	Start/end	An oval represents a start or end point
→	Arrows	A line is a connector that shows relationships between the representative shapes
▱	Input/Output	A parallelogram represents input or output
▭	Process	A rectangle represents a process
◇	Decision	A diamond indicates a decision

The basic flowchart are as follows:

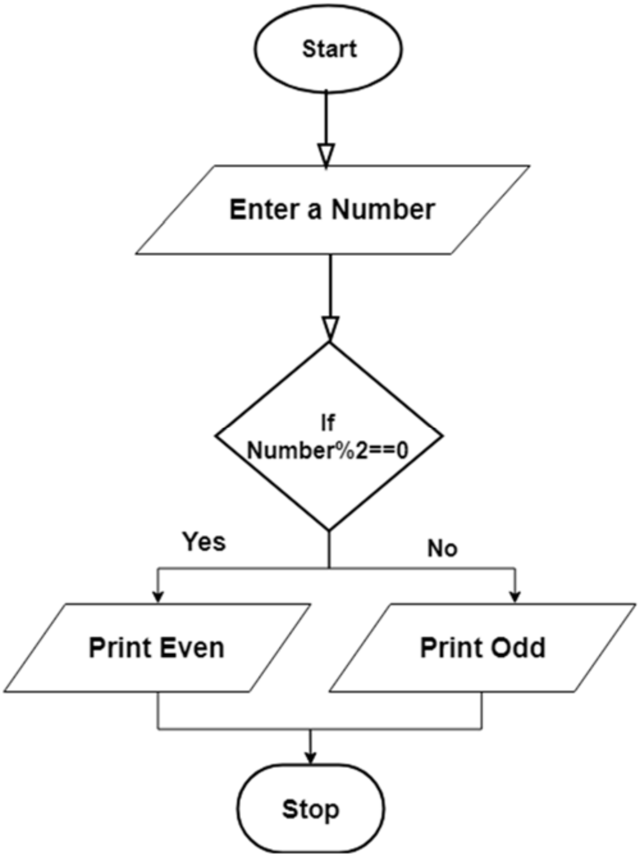


Flowchart to add two numbers

The flowchart to calculate personal Interest is as follows



The flowchart to calculate odd or even numbers.



Algorithm

An algorithm is a set of steps of operations to solve a problem performing calculation, data processing, and automated reasoning tasks. An algorithm is an efficient method that can be expressed within finite amount of time and space.

Algorithm for adding two numbers

```
Step 1:  start
Step2: input two numbers x and y
Step3: read two numbers x and y
Step4: z=x+y
Step5:  display result z
Step6: stop
```

Algorithm for calculating simple Interest

```
Step 1: start
Step 2: input principal, time and rate p,t,r
Step 3: read the p, t, and r
Step 4: Interest = (p*t*r)/100
Step 5: Display interest
Step 6: stop
```

Algorithm to print odd or even number

```
Step 1: Start
Step 2:  input Number
Step 3:  If Number%2 == 0 Then
Print: Number is an Even Number.
Else
Print: Number is an Odd Number.
Step 4: Exit
```

Pseudocode

Pseudocode is an informal way of programming description that does not require any strict programming language syntax or underlying technology considerations

Pseudocode for finding the area of rectangle

```
Input length breadth
Calculate area= length* breadth
Output area
```

Unit - 2

Installation of Java Tools

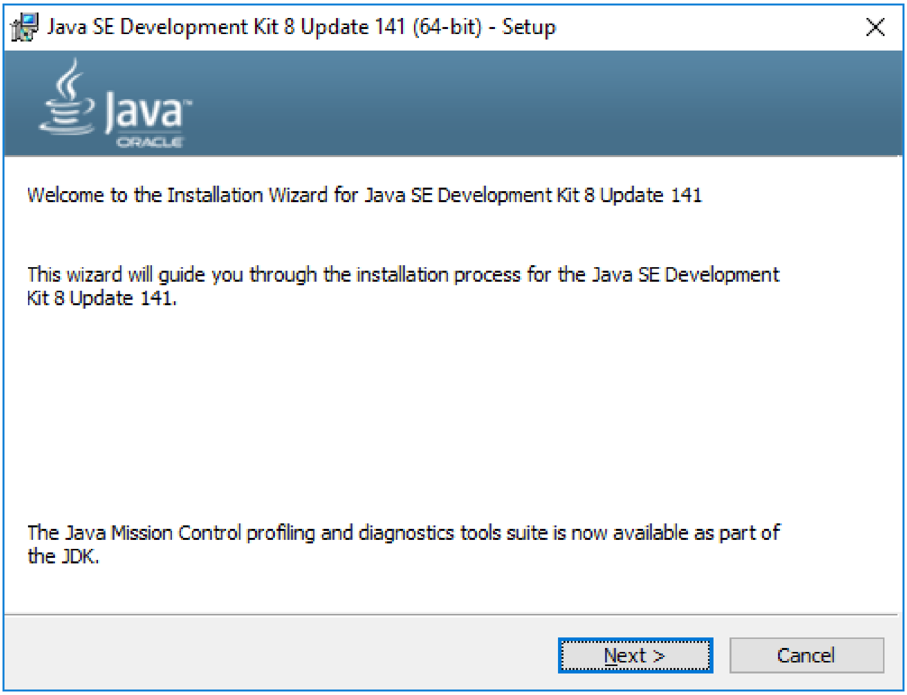
Console program to demonstrate conditional and looping statements.

Installation of Java Tools

For the installation of Java first of all we need to download Java from the internet the website for latest java download can be found at https://www.oracle.com/java/technologies/javase-downloads.html and after downloads the steps are as follows

Run the installer "jdk-8u141-windows-x64.exe"

The following wizard will be displayed that will take through the installation. Click "Next".



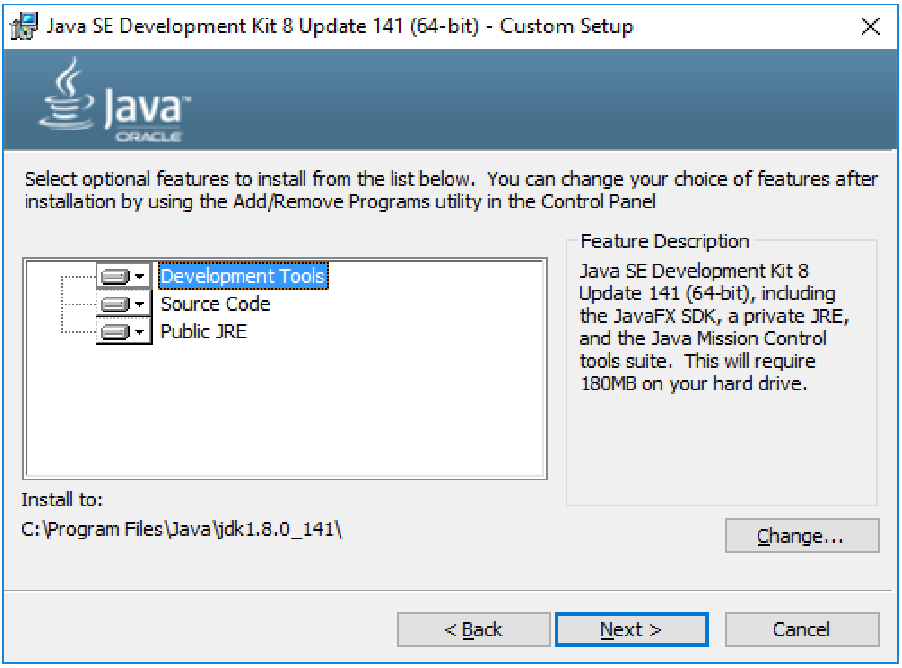
Java SE Development Kit 8 Update 141 (64-bit) - Setup

Welcome to the Installation Wizard for Java SE Development Kit 8 Update 141

This wizard will guide you through the installation process for the Java SE Development Kit 8 Update 141.

The Java Mission Control profiling and diagnostics tools suite is now available as part of the JDK.

Keep the defaults and click "Next".



Java SE Development Kit 8 Update 141 (64-bit) - Custom Setup

Select optional features to install from the list below. You can change your choice of features after installation by using the Add/Remove Programs utility in the Control Panel

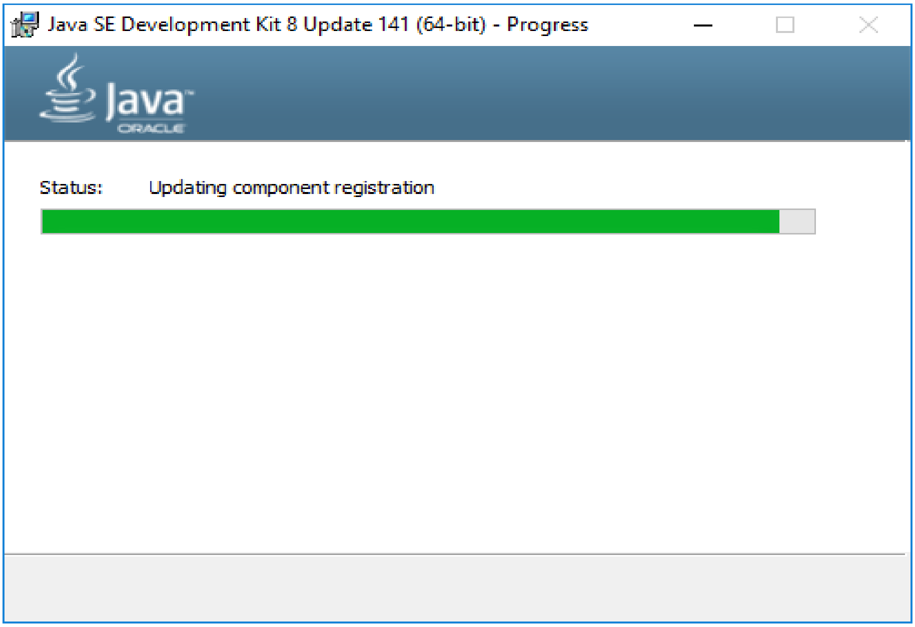
- Development Tools
- Source Code
- Public JRE

Feature Description

Java SE Development Kit 8 Update 141 (64-bit), including the JavaFX SDK, a private JRE, and the Java Mission Control tools suite. This will require 180MB on your hard drive.

Install to:

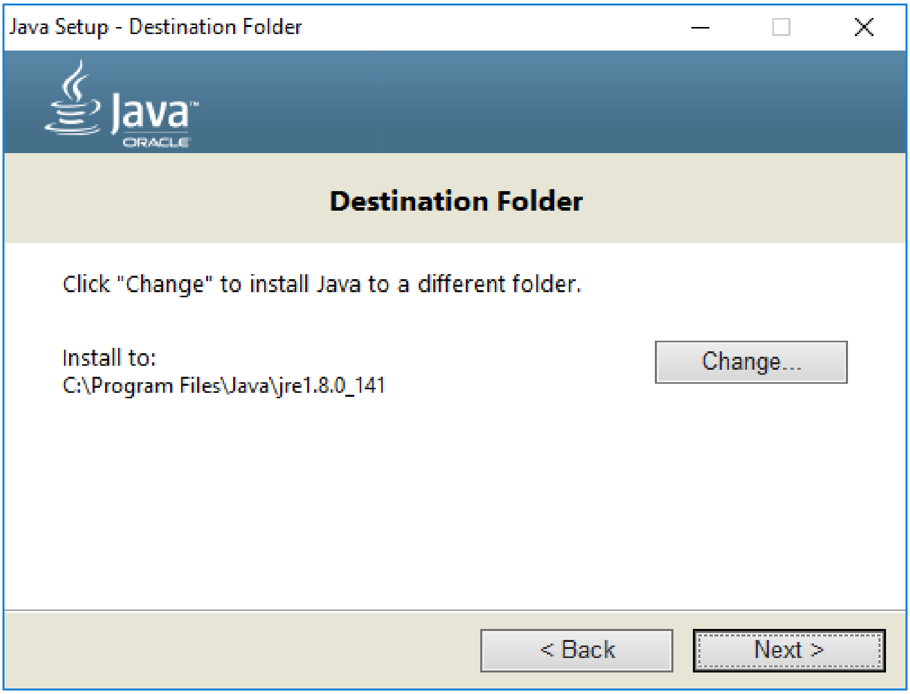
C:\Program Files\Java\jdk1.8.0_141\



Java SE Development Kit 8 Update 141 (64-bit) - Progress

Status: Updating component registration

Java will be installed at C:\Program Files.



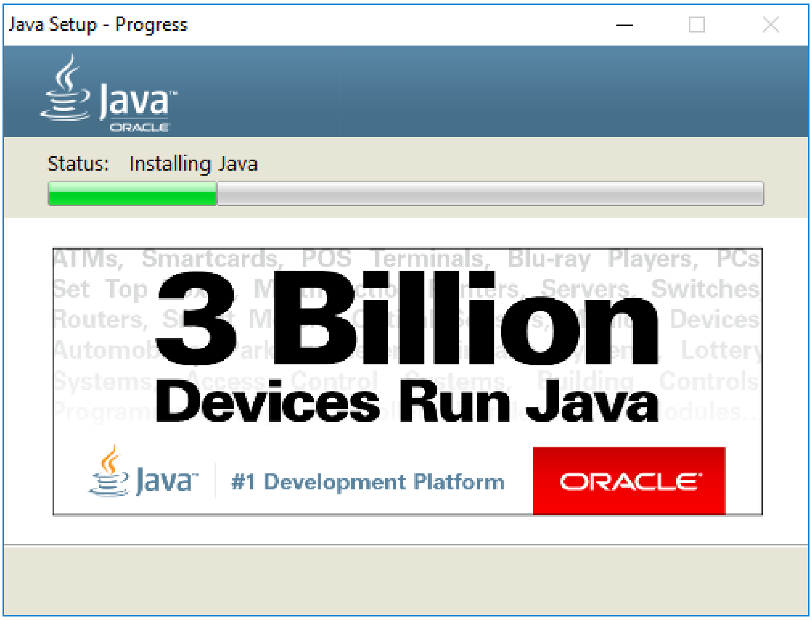
Java Setup - Destination Folder

Destination Folder

Click "Change" to install Java to a different folder.

Install to:
C:\Program Files\Java\jre1.8.0_141

Java is being installed.

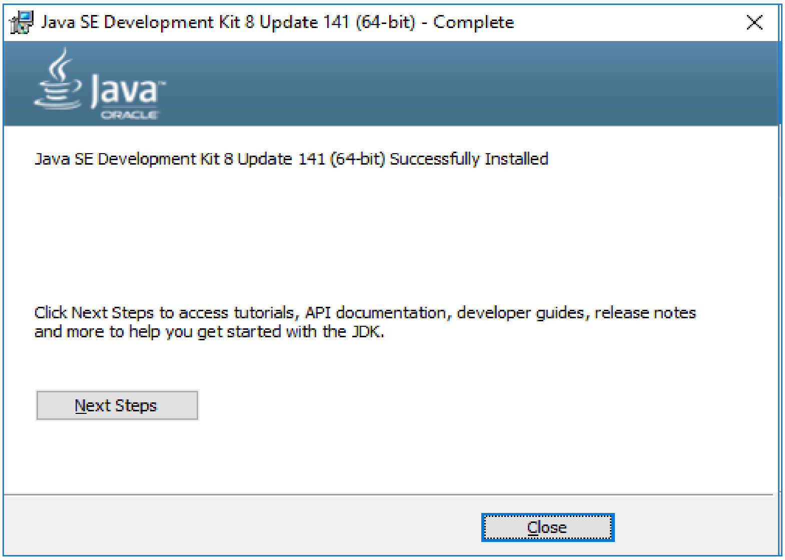


Java Setup - Progress

Status: Installing Java

After installation of Java is completed the following windows is seen. One can get documents related to java by clicking “Next Steps”.

Click "close" to finish the installation.



Java SE Development Kit 8 Update 141 (64-bit) Successfully Installed

Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.

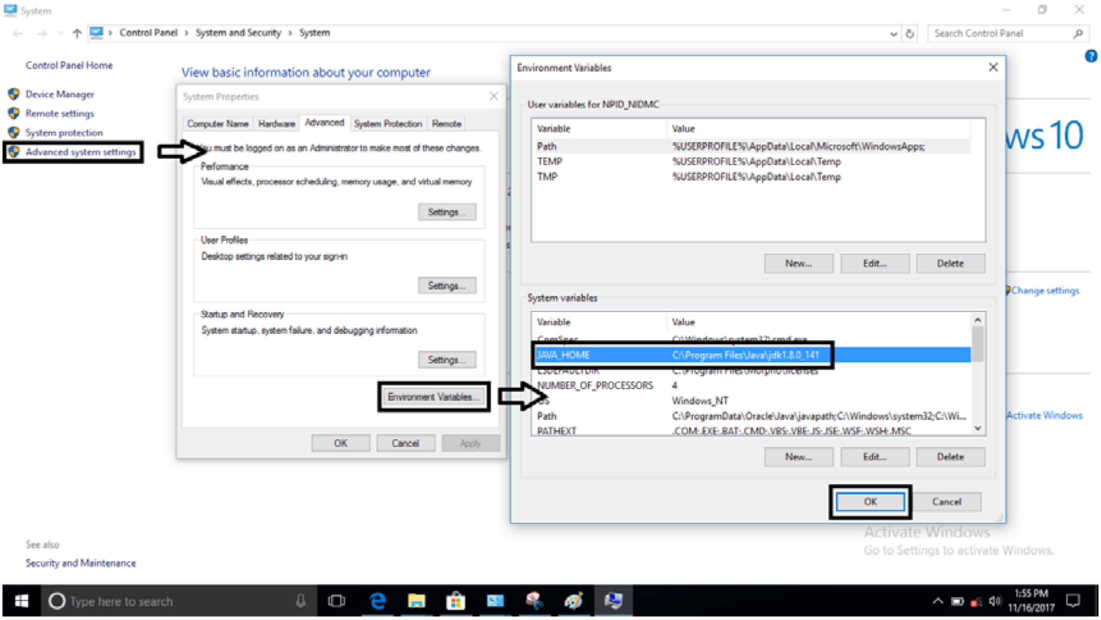
Before working with Java it is required to set path of java in environment variables.

Follow these steps:

From "Advance system settings" ->"Advanced" ->select "Environment Variables"

Put value of JAVA_HOME as absolute path where java is installed.

Ex: C:\Program Files\Java\jdk1.8.0_141



You must be logged on as an Administrator to make most of these changes.

Performance

Visual effects, processor scheduling, memory usage, and virtual memory

User Profiles

Desktop settings related to your sign-in

Startup and Recovery

System startup, system failure, and debugging information

User variables for NPID_NIDMC

Variable	Value
Path	%USERPROFILE%\AppData\Local\Microsoft\WindowsApps;
TEMP	%USERPROFILE%\AppData\Local\Temp
TMP	%USERPROFILE%\AppData\Local\Temp

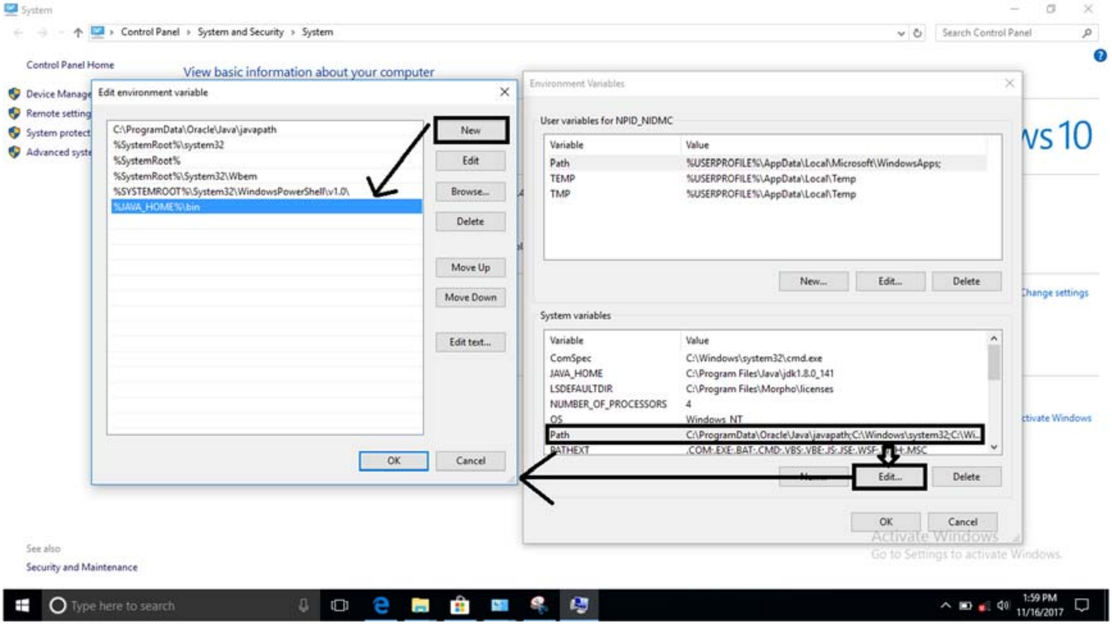
System variables

Variable	Value
ComSpec	C:\Windows\system32\cmd.exe
JAVA_HOME	C:\Program Files\Java\jdk1.8.0_141
LSDEFAULTDIR	C:\Program Files\Morpho\licenses
NUMBER_OF_PROCESSORS	4
OS	Windows_NT
Path	C:\ProgramData\Oracle\Java\javapath;C:\Windows\system32;C:\Wi...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC

Select “path” and click on “edit”.

Create a new path by clicking “new” and adding “bin” to path.

New->”%JAVA_HOME%\bin”->OK



Edit environment variable

```
C:\ProgramData\Oracle\Java\javapath
%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
%JAVA_HOME%\bin
```

Environment Variables

User variables for NPID_NIDMC

Variable	Value
Path	%USERPROFILE%\AppData\Local\Microsoft\WindowsApps;
TEMP	%USERPROFILE%\AppData\Local\Temp
TMP	%USERPROFILE%\AppData\Local\Temp

System variables

Variable	Value
ComSpec	C:\Windows\system32\cmd.exe
JAVA_HOME	C:\Program Files\Java\jdk1.8.0_141
LSDEFAULTDIR	C:\Program Files\Morpho\licenses
NUMBER_OF_PROCESSORS	4
OS	Windows_NT
Path	C:\ProgramData\Oracle\Java\javapath;C:\Windows\system32;C:\Wi...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC

Java environment variable is set.

So by following the above procedure Java will be installed and java environment variables will be set.

Console program to demonstrate conditional and looping statements

Program to check greatest among two numbers

```
public class Sample{
public static void main(String args[]) {
        int a = 80, b = 30;
        if (b > a) {
        System.out.println("b is greater");
        } else {
        System.out.println("a is greater");
```

```
                }
        }
        }
```

Output

```
a is greater
```

Program to illustrate if else if statement

```
public class Sample {
public static void main(String args[]) {
        int a = 30, b = 30;
        if (b > a) {
System.out.println("b is greater");
        }
        else if(a > b){
System.out.println("a is greater");
        }
        else {
System.out.println("Both are equal");
        }
        }
        }
```

Output

```
Both are equal
```

Program to illustrate Switch statement

```
public class Sample {
public static void main(String args[]) {
        int a = 5;
        switch (a) {
        case 1:
System.out.println("You chose One");
        break;
        case 2:
System.out.println("You chose Two");
        break;
        case 3:
System.out.println("You chose Three");
        break;
        case 4:
System.out.println("You chose Four");
        break;
        case 5:
System.out.println("You chose Five");
        break;
        default:
System.out.println("Invalid Choice. Enter a no between 1 and 5");
        break;
        }
        }
```

```
    }
```

Output

```
You choose five
```

Basic example to illustrate while loop

```
public class Sample {
public static void main(String args[]) {
    int n = 1, times = 5;
    while (n <= times) {
System.out.println("Java while loops:" + n);
    n++;
        }
        }
    }
```

Output

```
Java while loops: 1
Java while loops: 2
Java while loops: 3
Java while loops: 4
Java while loops: 5
```

The basic program to illustrate do-while loop in java is

```
public class Sample {
public static void main(String args[]) {
    int n = 1, times = 0;
```

```
        do {
        System.out.println("Java do while loops:" + n);
        n++;
        } while (n <= times);
        }
        }
```

Output

```
Java do while loops: 1
```

The basic program to illustrate for loop is

```
public class Sample {
public static void main(String args[]) {
        int n = 1, times = 5;
        for (n = 1; n <= times; n = n + 1) {
System.out.println("Java for loops:" + n);
        }
        }
        }
```

Output

```
Java for loops: 1
Java for loops: 2
Java for loops: 3
Java for loops: 4
Java for loops: 5
```

Unit - 3

Demonstrate class, object, methods, constructor, and Inheritance,

Class and object Demonstration

```
Class Student{
int id;
string name;
Public static void main(String args[]){
Student s1=new Student(); //creating an object of student
System.out.println(s1.id);
System.out.println(s1.name);
}
}
```

Method Demonstration

```
public class Example {
public static void main(String argu[]) {
        int val1 = 62;
        int val2 = 8;
        int res = fun(val1, val2);
        System.out.println("Result is: " + res);
        }
public static int fun(int g1, int g2) {
        int ans;
        ans = g1 + g2;
        return ans;
```

```
                }
                }
```

Output

```
Result is: 70
```

Constructor Demonstration

```
import java.util.*;
import java.lang.*;
import java.io.*;
class clerk{
        int roll=101;
        String grade="Manager";
        void display(){System.out.println(roll+" "+grade);}
        public static void main(String args[]){
        clerk c1=new clerk();
        clerk c2=new clerk();
        c1.display();
        c2.display();
        }
        }
```

Inheritance Demonstration

```
        class Teacher {
        void teach() {
        System.out.println("Teaching subjects");
        }
```

```
}
class Students extends Teacher {
void listen() {
System.out.println("Listening to teacher");
}
}
class CheckForInheritance {
public static void main(String args[]) {
Students s1 = new Students();
s1.teach();
s1.listen();
}
}
```

Unit - 4

Create and import Java Package and Sub-Package.

Console Program to implement and apply interface.

```
interface Pet{
public void test();
        }
class Dog implements Pet{
public void test(){
        System.out.println("Interface Method Implemented");
        }
        public static void main(String args[]){
        Pet p = new Dog();
        p.test();
        }
        }
```

Unit - 5
Create I/O Stream program

Public final class console extends object

The basic example of java console is

```
import java.io.Console;
class ReadStringTest{
public static void main(String args[]){
Console c=System.console();
        System.out.println("Enter your name: ");
                String n=c.readLine();
        System.out.println("Welcome "+n);
                }
                }
```

The output of the following will be

```
Enter your name: Yogesh
Welcome Yogesh
```

Embed a Java Applet Program to a HTML File.

```
import java.applet.Applet;
import java.awt.Graphics;
public class HelloWorld extends Applet {
        public void paint(Graphics g) {
        g.drawString("Hello World!", 50, 25);
        }
    }
```

Now we have to create an html file that includes the applet. The html file must be placed in the same directory as the java file. The HTML file must contain the following code:

```
<html>
    <head>
        <TITLE> A Simple Program </TITLE>
    </head>
    <body>
    Here is the output of my program:
    <applet code="HelloWorld.class" width="150" height="25"></applet>
    </body>
</html>
```

Unit - 6
Install VB.NET Program

Step 1 - Make sure your computer is ready for Visual Studio

Before you begin installing Visual Studio:

Apply the latest Windows updates. These updates ensure that your computer has both the latest security updates and the required system components for Visual Studio.

Step 2 - Download Visual Studio

Next, download the Visual Studio bootstrapper file.

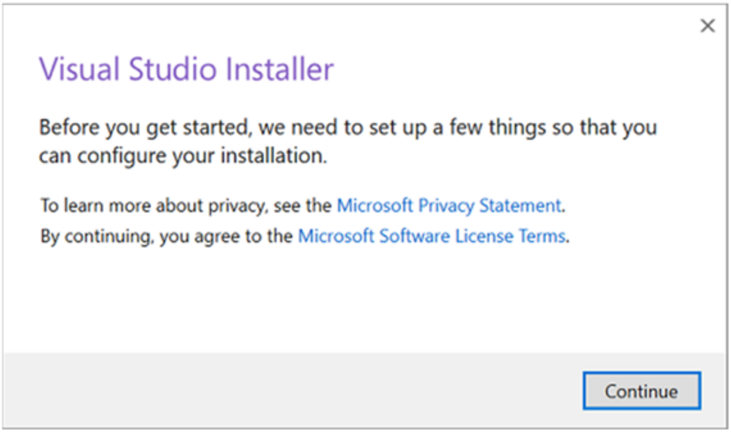
To do so, choose the following button, choose the edition of Visual Studio that you want, choose **Save**, and then choose **Open folder**.

Step 3 - Install the Visual Studio installer

Run the bootstrapper file to install the Visual Studio Installer. This new lightweight installer includes everything you need to both install and customize Visual Studio.

From your **Downloads** folder, double-click the bootstrapper that matches or is similar to one of the following files:

vs_community.exe for Visual Studio Community(as other editions are not preferrable



Visual Studio Installer

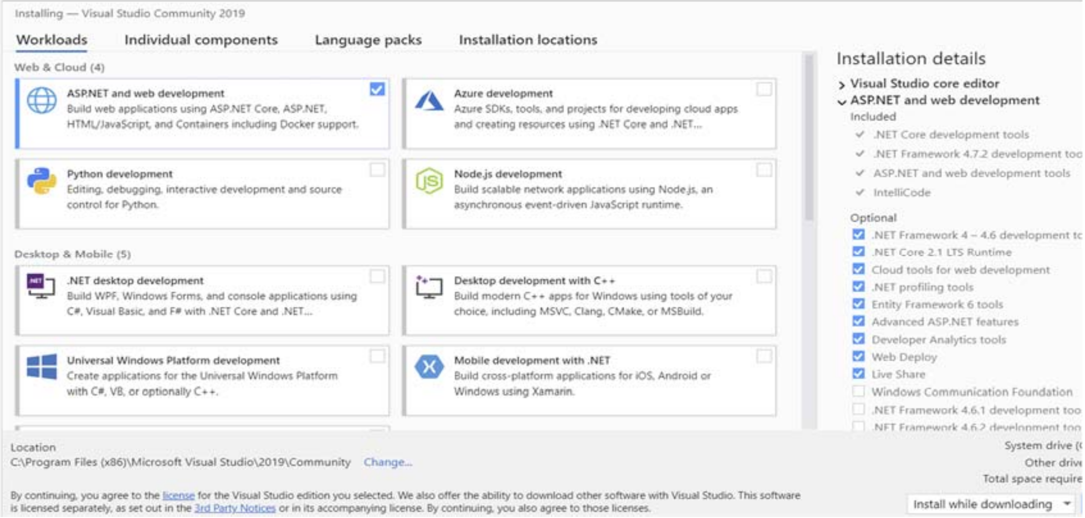
Before you get started, we need to set up a few things so that you can configure your installation.

To learn more about privacy, see the Microsoft Privacy Statement.
By continuing, you agree to the Microsoft Software License Terms.

Step 4 - Choose workloads

After the installer is installed, you can use it to customize your installation by selecting the feature sets—or workloads—that you want. Here's how.

Find the workload you want in the **Visual Studio Installer**.



Web & Cloud (4)

☑ ASP.NET and web development
Build web applications using ASP.NET Core, ASP.NET, HTML/JavaScript, and Containers including Docker support.

□ Azure development
Azure SDKs, tools, and projects for developing cloud apps and creating resources using .NET Core and .NET...

□ Python development
Editing, debugging, interactive development and source control for Python.

□ Node.js development
Build scalable network applications using Node.js, an asynchronous event-driven JavaScript runtime.

Desktop & Mobile (5)

□ .NET desktop development
Build WPF, Windows Forms, and console applications using C#, Visual Basic, and F# with .NET Core and .NET...

□ Desktop development with C++
Build modern C++ apps for Windows using tools of your choice, including MSVC, Clang, CMake, or MSBuild.

□ Universal Windows Platform development
Create applications for the Universal Windows Platform with C#, VB, or optionally C++.

□ Mobile development with .NET
Build cross-platform applications for iOS, Android or Windows using Xamarin.

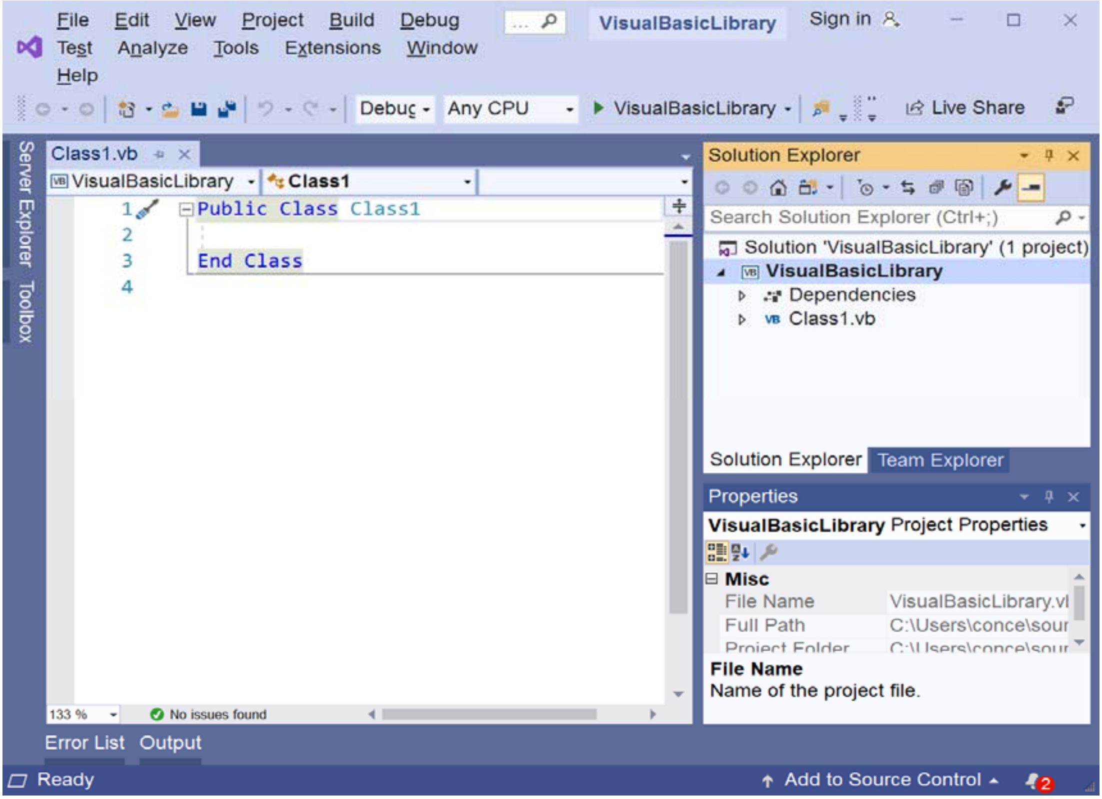
Installation details
> Visual Studio core editor
⌄ ASP.NET and web development
Included
✓ .NET Core development tools
✓ .NET Framework 4.7.2 development too
✓ ASP.NET and web development tools
✓ IntelliCode
Optional
☑ .NET Framework 4 – 4.6 development t
☑ .NET Core 2.1 LTS Runtime
☑ Cloud tools for web development
☑ .NET profiling tools
☑ Entity Framework 6 tools
☑ Advanced ASP.NET features
☑ Developer Analytics tools
☑ Web Deploy
☑ Live Share
□ Windows Communication Foundation
□ .NET Framework 4.6.1 development too
□ .NET Framework 4.6.2 development too

Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community Change...

System drive (
Other driv
Total space require

By continuing, you agree to the license for the Visual Studio edition you selected. We also offer the ability to download other software with Visual Studio. This software is licensed separately, as set out in the 3rd Party Notices or in its accompanying license. By continuing, you also agree to those licenses.

Install while downloading



```
Public Class Class1

End Class
```

Solution 'VisualBasicLibrary' (1 project)
- VisualBasicLibrary
  - Dependencies
  - Class1.vb

VisualBasicLibrary Project Properties

Misc

File Name	VisualBasicLibrary.vl
Full Path	C:\Users\conce\sour
Project Folder	C:\Users\conce\sour

File Name
Name of the project file.

For example, choose the "ASP.NET and web development" workload. It comes with the default core editor, which includes basic code editing support for over 20 languages, the ability to open and edit code from any folder without requiring a project, and integrated source code control.

After you choose the workload(s) you want, choose **Install**. After installation you are ready to go for development.

Unit - 7

Console Program to declare variables and data types

```
using System;

namespace DeclaringConstants {

class Program {

static void Main(string[] args) {

        char ch = 'g';

        int xy = 6, roll = 42;

        byte b = 22;

        double pi = 3.14159;

        float salary = 20000.0f;

        }

        }

        }
```

Console Program to demonstrate conditional and looping statements.

While loop

```
using System;

class Example

        {

        public static void Main()

        {

        int cntr = 1;

        while (cntr<= 5)

        {
```

```
        Console.WriteLine(" Hello World "+cntr);
        cntr++;
        }
        }
        }
```

The output of the program will be

```
Hello World 1
 Hello World 2
 Hello World 3
 Hello World 4
 Hello World 5
```

For loop

```
using System;
class Example
        {
        public static void Main()
        {
        for (int cntr = 1; cntr<= 5; cntr++)
        Console.WriteLine(" Hello world "+cntr);
        }
        }
```

The output of the following will be:

```
Hello World 1
 Hello World 2
 Hello World 3
 Hello World 4
 Hello World 5
```

Do-while loop

```
using System;
class Example
        {
        public static void Main()
        {
        int cntr = 11;
        do
        {
        Console.WriteLine(" Hello world "+cntr);
        cntr++;
        }
        while (cntr< 10);
        }
        }
```

The output will be

```
Hello world 11
```

Console program to demonstrate Sub and Functions.

```
using System;
namespace FunctionExample
{
    class Program
    {
    // User defined function
    public string Show(string message)
    {
    Console.WriteLine("Inside Show Function");
    return message;
    }
    // Main function, execution entry point of the program
    static void Main(string[] args)
    {
    Program program = new Program();
    string message = program.Show("Rahul Kumar");
    Console.WriteLine("Hello "+message);
    }
    }
    }
```

Use MsgBox and InputBox with properties

```
<!DOCTYPE html>
<html>
    <body>
    <script language = "vbscript" type = "text/vbscript">
    ' Input Box with only Prompt
    InputBox("Enter a number")
    ' Input Box with a Title
    a = InputBox("Enter a Number","Enter Value")
msgbox a
    ' Input Box with a Prompt,Title and Default value
    a = InputBox("Enter a Number","Enter Value",123)
msgbox a
    ' Input Box with a Prompt,Title,Default and XPos
    a = InputBox("Enter your name","Enter Value",123,700)
msgbox a
    ' Input Box with a Prompt,Title and Default and YPos
    a = InputBox("Enter your name","Enter Value",123,,500)
msgbox a
    </script>
    </body>
</html>
```

Design Form and develop a simple calculator.

```
Public Class calculator
    ' two numbers to do the calc
    Dim num1, num2 As Double
    ' check if an operator is clicked for the first time
    Dim oprClickCount As Integer = 0
    ' check if an operator is clicked befor
    Dim isOprClick As Boolean = False
    ' check if equal is clicked befor
    Dim isEqualClick As Boolean = False
    ' get the operator
    Dim opr As String
    Private Sub calculator_Load(sender As Object, e AsEventArgs) Handles MyBase.Load
    ' add click event to all button in the form
    For Each c As Control In Controls
    ' if the control is button
    If c.GetType() = GetType(Button) Then
    If Not c.Text.Equals("Reset") Then
    ' add action to the button
    AddHandlerc.Click, AddressOfbtn_Click
    End If
    End If
Next
End Sub
' create a button click event
    Private Sub btn_Click(sender As Object, e As EventArgs)
    Dim button As Button = sender
    If Not isOperator(button) Then
        ' if number
        If isOprClick Then
        ' if an opr is clicked
        ' get and convert to double textbox text
        num1 = Double.Parse(TextBox1.Text)
        ' clear textbox text
        TextBox1.Text = ""
    End If
    If Not TextBox1.Text.Contains(".") Then
    ' if "." not already in the textbox
    If TextBox1.Text.Equals("0") AndAlso Not button.Text.Equals(".") Then
    TextBox1.Text = button.Text
    isOprClick = False
Else
    TextBox1.Text += button.Text
    isOprClick = False
End If
    ElseIf Not button.Text.Equals(".") Then
    ' if the button is not a "."
    TextBox1.Text += button.Text
    isOprClick = False
End If
    Else
        ' if operator
        If oprClickCount = 0 Then
        ' if we click on an operator for the first time
    oprClickCount += 1
    num1 = Double.Parse(TextBox1.Text)
    opr = button.Text
    isOprClick = True
Else
```

```
          If Not button.Text.Equals("=") Then
          ' if the button is not "="
          If Not isEqualClick Then
          ' if "=" is not clicked befor
          num2 = Double.Parse(TextBox1.Text)
          TextBox1.Text = Convert.ToString(calc(opr, num1, num2))
          num2 = Double.Parse(TextBox1.Text)
          opr = button.Text
          isOprClick = True
          isEqualClick = False
Else
          isEqualClick = False
          opr = button.Text
End If
Else
          num2 = Double.Parse(TextBox1.Text)
          TextBox1.Text = Convert.ToString(calc(opr, num1, num2))
          num1 = Double.Parse(TextBox1.Text)
          isOprClick = True
          isEqualClick = True
          End If
          End If
          End If
End Sub
          ' create a function to check if the button is a number or an operator
```

```
    Function isOperator(ByValbtn As Button) As Boolean
    Dim btnText As String
    btnText = btn.Text
    If (btnText.Equals("+") Or btnText.Equals("-") Or btnText.Equals("/") Or
    btnText.Equals("X") Or btnText.Equals("=")) Then
    Return True
Else
    Return False
    End If
End Function
    ' create a function to do the calc
    Function calc(ByVal op As String, ByVal n1 As Double, ByVal n2 As Double) As Double
    Dim result As Double
    result = 0
    Select Case op
    Case "+"
    result = n1 + n2
    Case "-"
    result = n1 - n2
    Case "X"
    result = n1 * n2
    Case "/"
    If n2 <> 0 Then
    result = n1 / n2
```

```
End If
        End Select
Return result
End Function
        Private Sub ButtonReset_Click(sender As Object, e As EventArgs) Handles ButtonReset.Click
        num1 = 0
        num2 = 0
        opr = ""
        oprClickCount = 0
        isOprClick = False
        isEqualClick = False
        TextBox1.Text = "0"
        End Sub
End Class
```

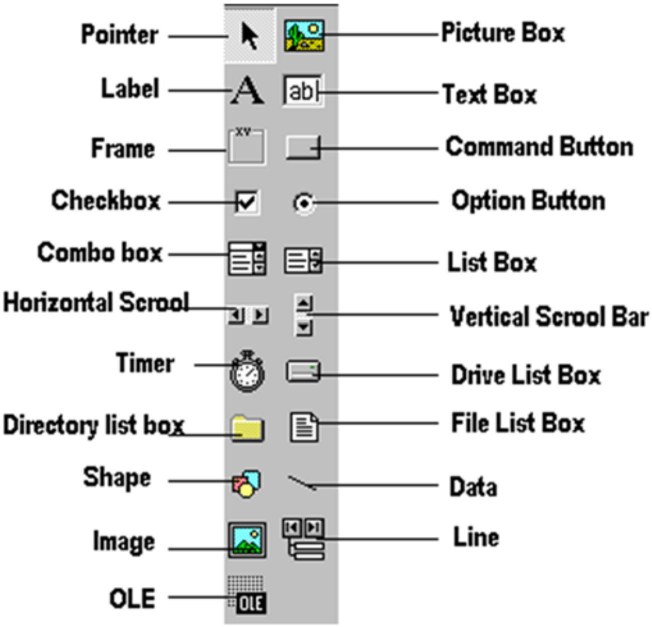
Use Toolbox with properties

In visual basic, you have to design the user interface. A visual basic interface consists of objects that we place on screen in such a manner so that screen looks pretty and you can work with those objects.

To design your user interface, we have to follow simply these steps-

1. At first, Create a form.
2. Choose the object you want to draw from the Toolbox.
3. Draw the object on the form.

So, create an object in visual basic, you have to use toolbox.



Create DialogBoxes

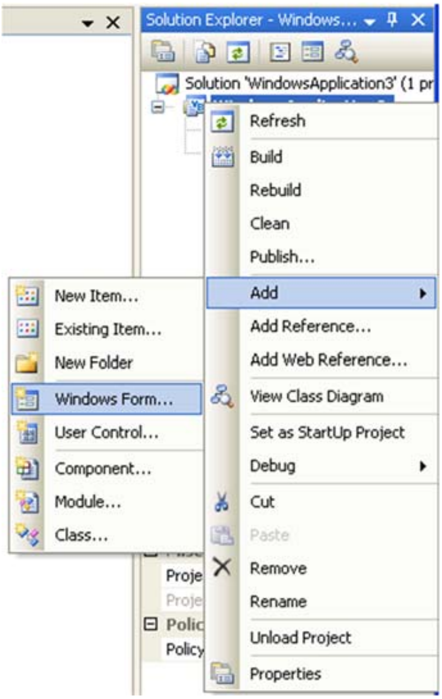
Dialog Boxes in Windows Forms

Dialog boxes are used to interact with the user and retrieve information. In simple terms, a dialog box is a form with its FormBorderStyle Enumeration property set to **FixedDialog**. You can construct your own custom dialog boxes using the Windows Forms Designer. Add controls such as **Label**, **Textbox**, and **Button** to customize dialog boxes to your specific needs. The .NET Framework also includes predefined dialog boxes (such as File Open, and message boxes), which you can adapt for your own applications.

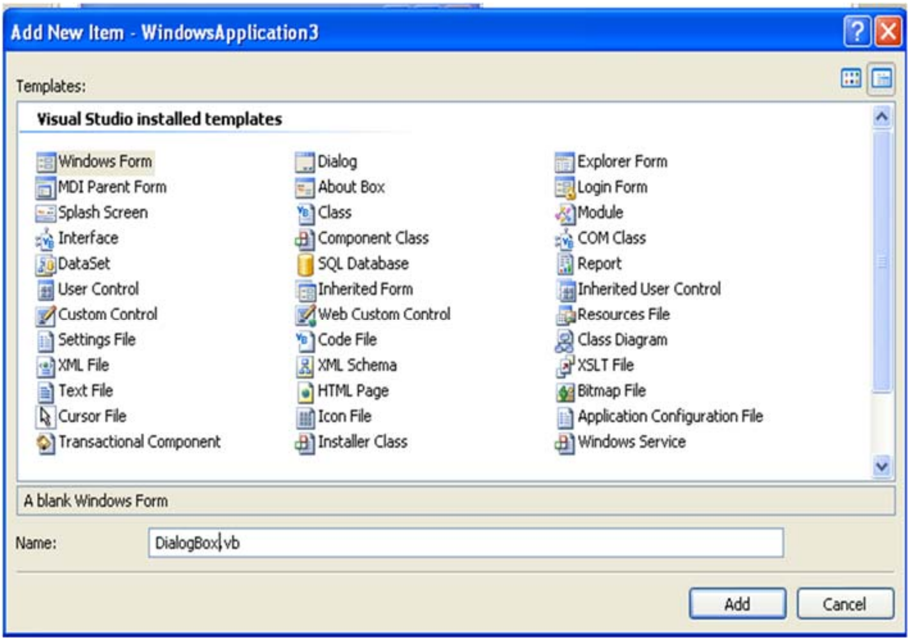
Creating Dialog Box at design time

Here is the step by step method to create a dialog box :

Add a form to your project by right-clicking the project in **Solution Explorer**, pointing to **Add**, and then clicking **Windows Form**.



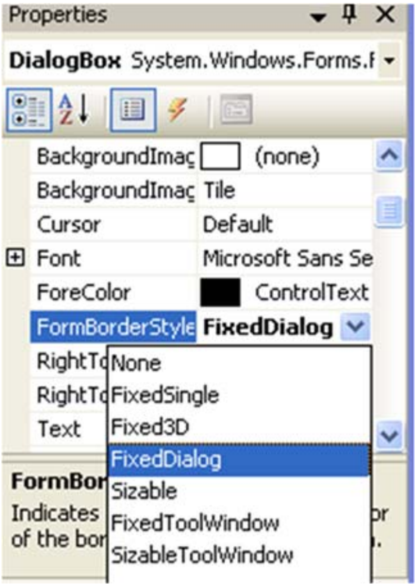
Right-click the form in **Solution Explorer** and choose **Rename**. Rename the form "DialogBox.vb".



A blank Windows Form

Name: DialogBox.vb

In the **Properties** window, change the FormBorderStyle property to **FixedDialog**.



DialogBox System.Windows.Forms.F

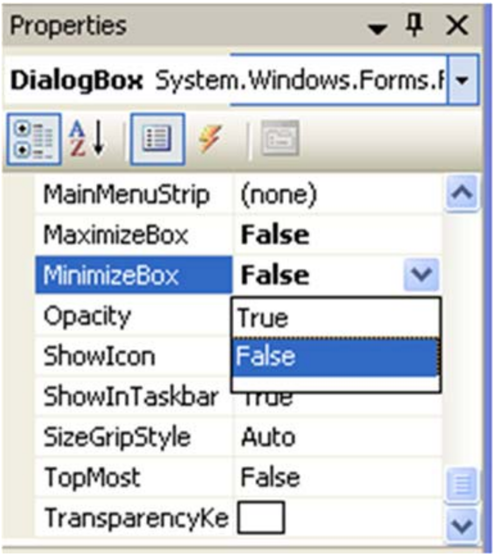
BackgroundImag	(none)
BackgroundImag	Tile
Cursor	Default
⊞ Font	Microsoft Sans Se
ForeColor	ControlText
FormBorderStyle	**FixedDialog**
RightTo	
RightTo	
Text	

FormBor
Indicates ... or
of the bor ... .

Customize the appearance of the form as needed.

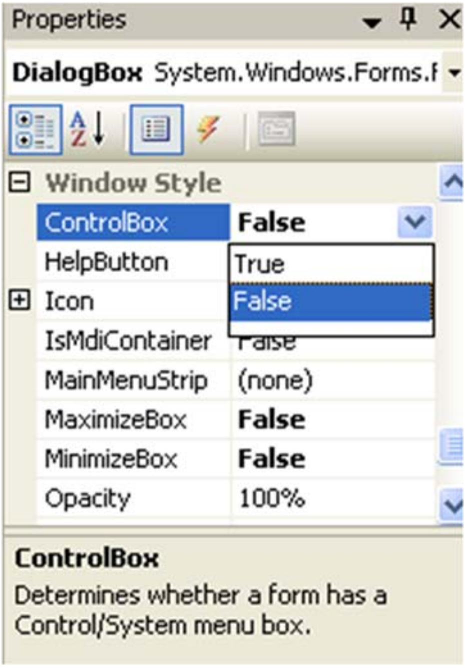
Set the ControlBox, MinimizeBox, and MaximizeBox properties to false.

Dialog boxes do not usually include menu bars, window scroll bars, Minimize and Maximize buttons, status bars, or sizable borders.



DialogBox System.Windows.Forms.F

MainMenuStrip	(none)
MaximizeBox	**False**
MinimizeBox	**False**
Opacity	
ShowIcon	
ShowInTaskbar	True
SizeGripStyle	Auto
TopMost	False
TransparencyKe	□



ControlBox	False
HelpButton	
Icon	
IsMdiContainer	False
MainMenuStrip	(none)
MaximizeBox	False
MinimizeBox	False
Opacity	100%

ControlBox
Determines whether a form has a Control/System menu box.

Customize event methods in the Code Editor.

```
Public Class DialogBox

        Private Sub DialogBox_Load(ByVal sender As System.Object, ByVal e As Sy
stem.EventArgs) Handles MyBase.Load
        End Sub

End Class
```

Create MDI Menu

MDI (Multiple Document Interface)

An application allows to work on multiple files and where the user needs to work with several documents at one time.Such applications contain a parent form as container form and other child forms.

To make a form as MDI Form set its IsMdiContainer property as true.

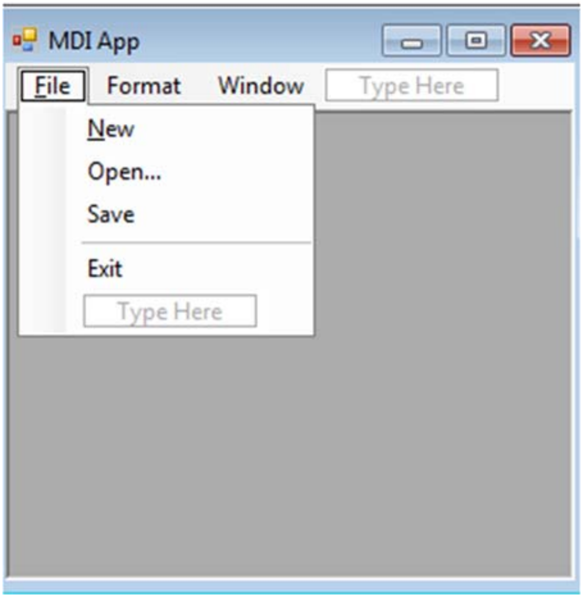
To define a parent form to a child form set MdiParent property.

To arrange the child forms, use LayoutMdi() method.

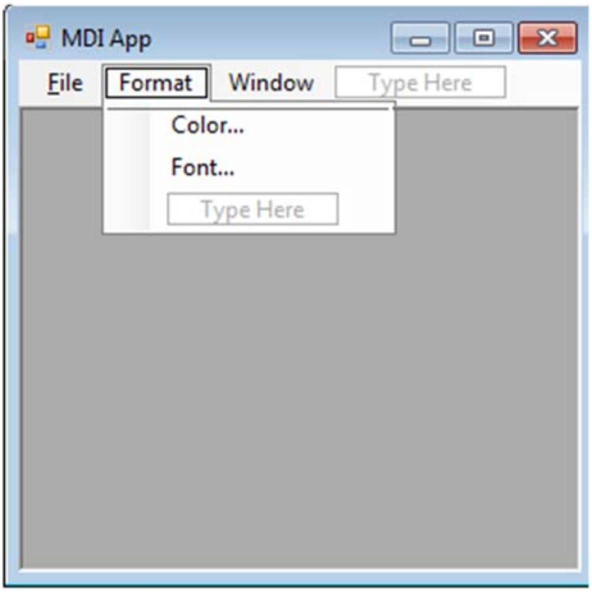
To get reference of the current child form use ActiveMdiChild property.

To get reference of a control from the child form use its Controls collection.

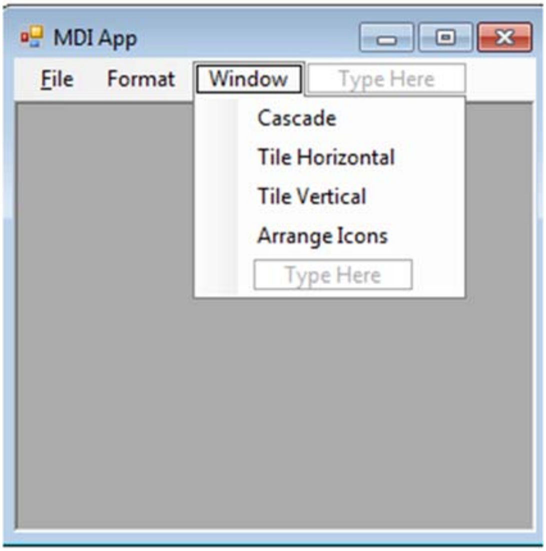
Now, double click on the menustrip and colordialog control and create a menu in the form. the form look like this the below forms.



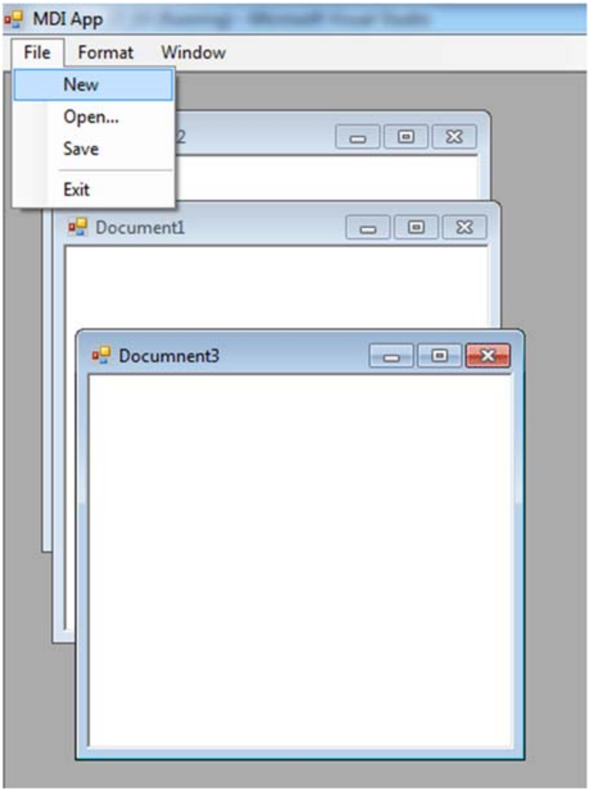
Format menu look like this the below form.



Window menu show look like this the below form.



Now run the form and click on the new to create new form like this the below form.



Now add this code.

```
Namespace MDIApp
        Partial Public Class frmMDI
        Inherits Form
        Private i As Integer
        Public Sub New()
        InitializeComponent()
        End Sub
        Private Sub frmMDI_Load(ByVal sender As Object, ByVal e As EventArgs)
        Dim f As New frmChild()
                f.MdiParent = Me
                f.Show()
                i = 2
        End Sub
        Private Sub newToolStripMenuItem_Click(ByVal sender As Object, ByVal e
As EventArgs)
        Dim f As New frmChild()
        f.MdiParent = Me
        f.Text
        = "Documnent" &System.Math.Max(System.Threading.Interlocked.Increment(
i), i - 1)
        f.Show()
End Sub
        Private Sub cascadeToolStripMenuItem_Click(ByVal sender As Object, ByVal
 e As EventArgs)
        Me.LayoutMdi(MdiLayout.Cascade)
```

```
End Sub
        Private Sub tileHorizontalToolStripMenuItem_Click(ByVal sender As Object,
ByVal e As EventArgs)
        Me.LayoutMdi(MdiLayout.TileHorizontal)
End Sub
        Private Sub tileVerticalToolStripMenuItem_Click(ByVal sender As Object, By
Val e As EventArgs)
        Me.LayoutMdi(MdiLayout.TileVertical)
End Sub
        Private Sub arrangeIconsToolStripMenuItem_Click(ByVal sender As Object,
ByVal e As EventArgs)
        Me.LayoutMdi(MdiLayout.ArrangeIcons)
End Sub
        Private Sub colorToolStripMenuItem_Click(ByVal sender As Object, ByVal e
As EventArgs)
        colorDialog1.ShowDialog()
        Dim t As RichTextBox = DirectCast(Me.ActiveMdiChild.Controls("txtMain"),
 RichTextBox)
        t.SelectionColor = colorDialog1.Color
        End Sub
End Class
End Namespace
```

Unit - 9

Create Class, Objects, Constructor and Methods

```
class Box
    {
    //Private fields
    private int length;
    private int width;
    private int heigth;
    //Constructor
    public Box(int length, int width, int height)
        {
        this.Length = length;
        this.Width = width;
        this.Heigth = height;
        }
    //Properties
    public int Length
        {
    get { return length; }
    set { length = value; }
        }
public int Width
    {
    get { return width; }
```

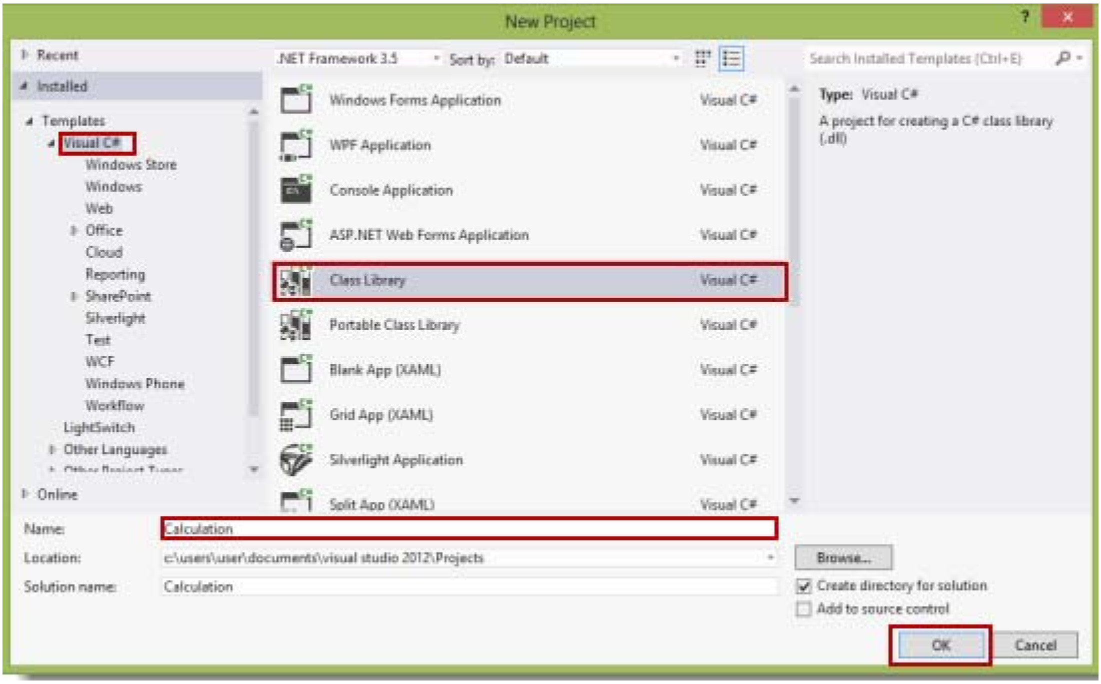
```
        set { width = value; }
        }
public int Heigth
        {
get { return heigth; }
set { heigth = value; }
        }
//Method
public int Volume()
        {
return this.Length * this.Width * this.Heigth;
        }
        }
```

Use build-in and user defined Component in Form.

Develop and use DLL.

Creating DLL File

Step 1 - Open Visual Studio then select "File" -> "New" -> "Project..." then seelct "Visual C#" -> "Class library".


New Project
Recent
Installed
Templates
Visual C#
Windows Store
Windows
Web
Office
Cloud
Reporting
SharePoint
Silverlight
Test
WCF
Windows Phone
Workflow
LightSwitch
Other Languages
Other Project Types
Online
.NET Framework 3.5
Sort by: Default
Search Installed Templates (Ctrl+E)
Windows Forms Application Visual C#
WPF Application Visual C#
Console Application Visual C#
ASP.NET Web Forms Application Visual C#
Class Library Visual C#
Portable Class Library Visual C#
Blank App (XAML) Visual C#
Grid App (XAML) Visual C#
Silverlight Application Visual C#
Split App (XAML) Visual C#
Browse...
OK
Cancel

Type: Visual C#

A project for creating a C# class library (.dll)

Name: Calculation

Location: c:\users\user\documents\visual studio 2012\Projects

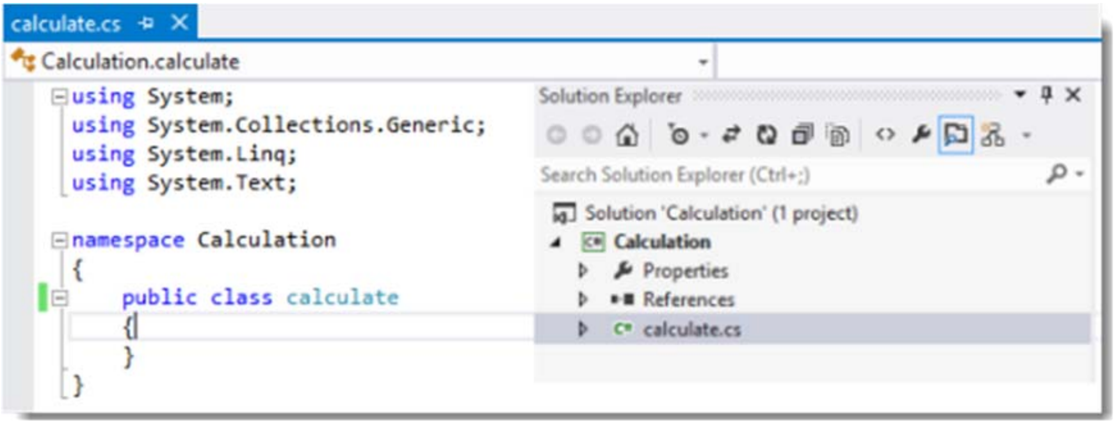
Solution name: Calculation

☑ Create directory for solution

□ Add to source control

(I give it the name "Calculation".)

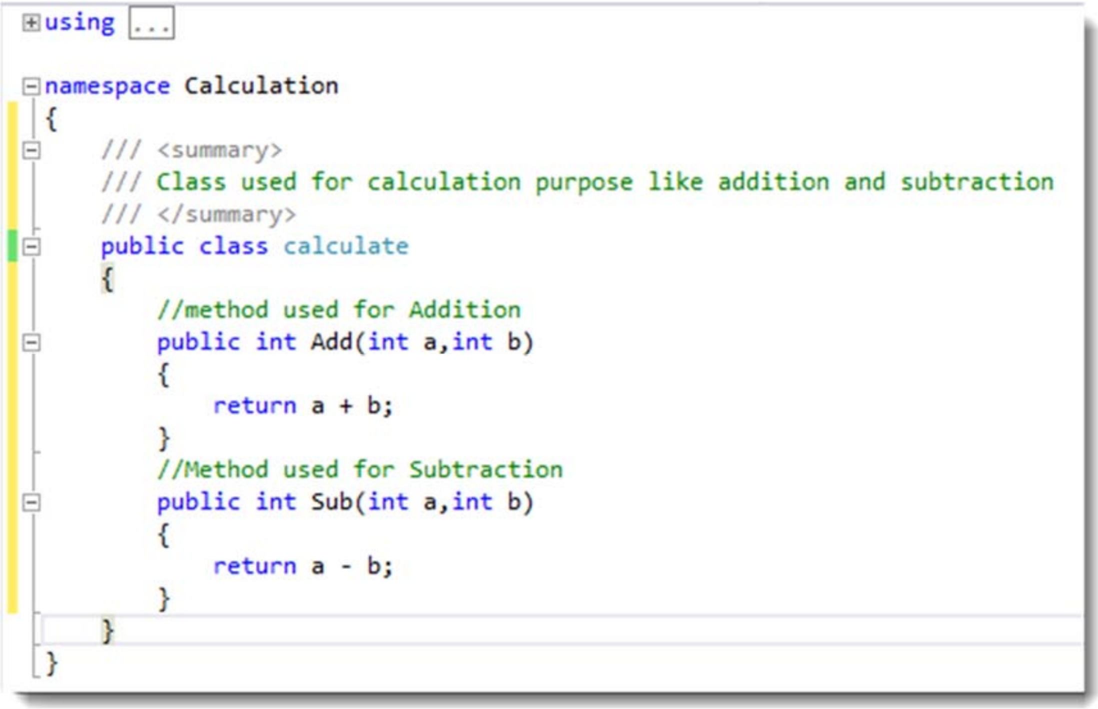
Step 2 - Change the class name ("class1.cs") to "calculate.cs".



```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

namespace Calculation
{
    public class calculate
    {
    }
}
```

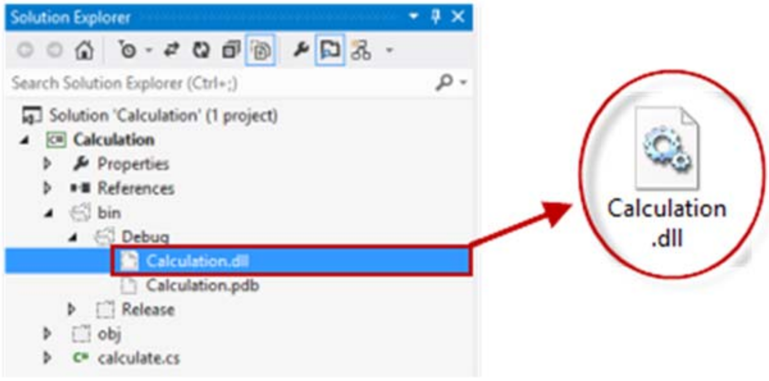
Solution 'Calculation' (1 project)
- Calculation
  - Properties
  - References
  - calculate.cs

Step 3 - In the calculate class, write methods for the addition and subtraction of two integers (for example purposes).



```
using ...

namespace Calculation
{
    /// <summary>
    /// Class used for calculation purpose like addition and subtraction
    /// </summary>
    public class calculate
    {
        //method used for Addition
        public int Add(int a,int b)
        {
            return a + b;
        }
        //Method used for Subtraction
        public int Sub(int a,int b)
        {
            return a - b;
        }
    }
}
```

Step 4 - Build the solution (F6). If the build is successful then you will see a "calculation.dll" file in the "bin/debug" directory of your project.

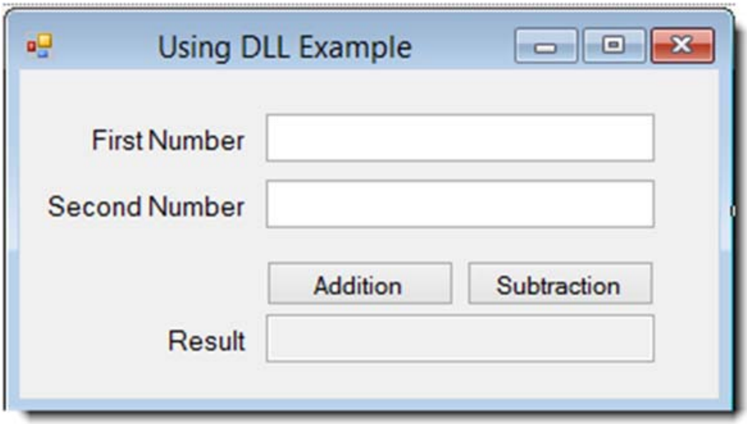


We have created our DLL file. Now we will use it in another application.

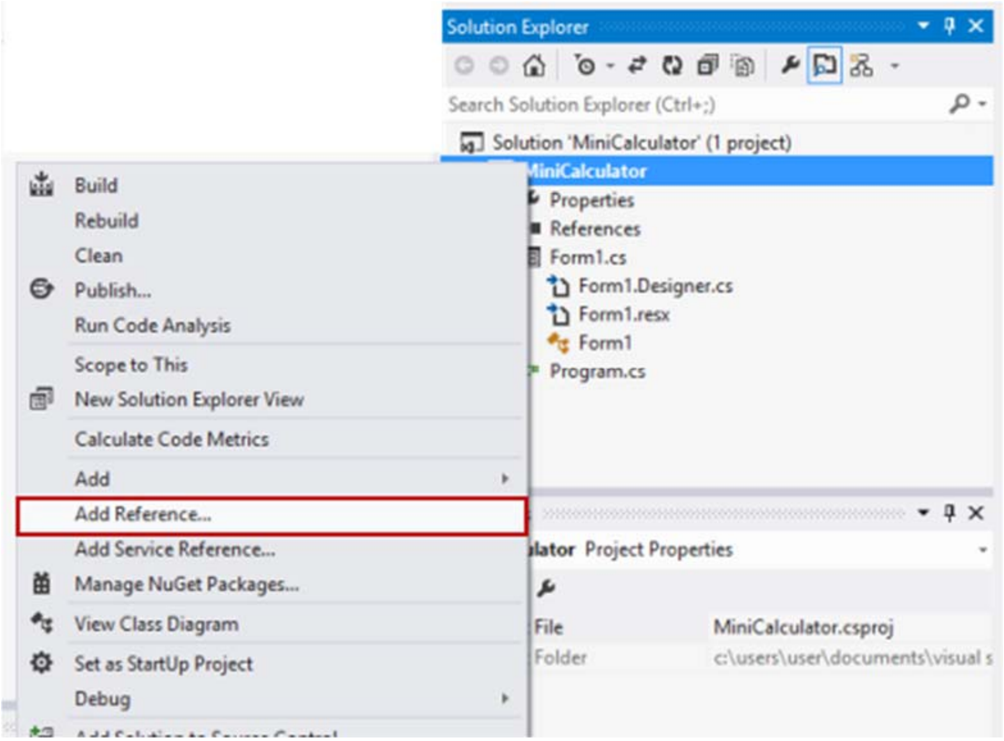
Using DLL File

Step 1 - Open Visual Studio then select "File" -> "New" -> "Project..." then select "Visual C#" -> "Windows Forms application".

Step 2 - Design the form as in the following image:



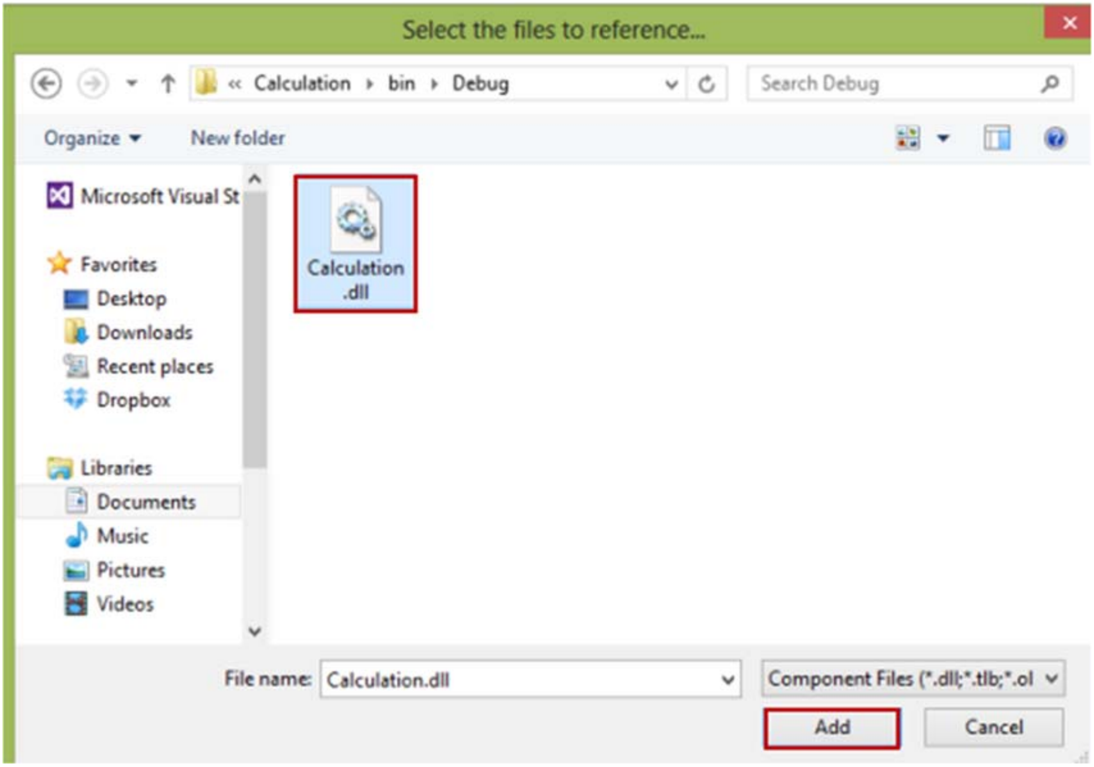
Step 3 - Add a reference for the dll file, "calculation.dll", that we created earlier. Right-click on the project and then click on "Add reference".



File: MiniCalculator.csproj

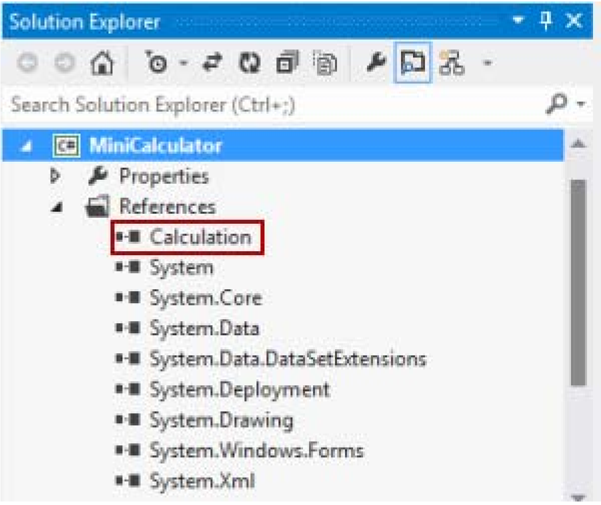
Folder: c:\users\user\documents\visual s

Step 4 - Select the DLL file and add it to the project.

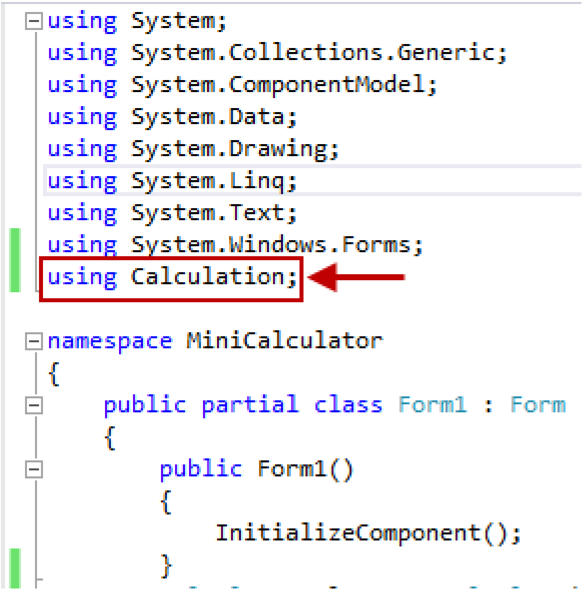


File name: Calculation.dll

After adding the file, you will see that the calculation namespace has been added (in references) as in the following:



Step 5 - Add the namespace ("using calculation;") as in the following:



```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;
using Calculation;

namespace MiniCalculator
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }
```

Step 6

```
using System;

using System.Collections.Generic;

using System.ComponentModel;

using System.Data;

using System.Drawing;

using System.Linq;

using System.Text;

using System.Windows.Forms;

using Calculation;

namespace MiniCalculator

{

    public partial class Form1 : Form

    {

    public Form1()
```

```
{
InitializeComponent();
}
calculate cal = new calculate();
//Addition Button click event
private void button1_Click(object sender, EventArgs e)
{
try
{
//storing the result in int i
int i = cal.Add(int.Parse(txtFirstNo.Text), int.Parse(txtSecNo.Text));
txtResult.Text = i.ToString();
}
catch (Exception ex)
{
MessageBox.Show(ex.Message);
}
}
//Subtraction button click event
private void button2_Click(object sender, EventArgs e)
{
Try
{
//storing the result in int i
int i = cal.Sub(int.Parse(txtFirstNo.Text), int.Parse(txtSecNo.Text));
```

```
                txtResult.Text = i.ToString();
                }
                catch (Exception ex)
                {
                MessageBox.Show(ex.Message);
                }
                }
        }
}
```

Develop a program to handle the exception

```
using System;
namespace ErrorHandlingApplication {
        class DivNumbers {
        int result;
        DivNumbers() {
        result = 0;
                }
                public void division(int num1, int num2) {
                try {
                result = num1 / num2;
                } catch (DivideByZeroException e) {
        Console.WriteLine("Exception caught: {0}", e);
                } finally {
        Console.WriteLine("Result: {0}", result);
                }
        }
        static void Main(string[] args) {
        DivNumbers d = new DivNumbers();
        d.division(25, 0);
        Console.ReadKey();
        }
        }
}
```

Unit - 10

Develop Database Connection Program with Insert, Update, Delete and Search Options.

Step 1

```
using System.Data.SqlClient;
```

You should use namespace given above to connect with SQL database.

Step2

You have to declare connection string outside the class.

```
SqlConnection con= new SqlConnection("Data Source=.;Initial Catalog=Sample;Integrated Security=true;");

SqlCommand cmd;

SqlDataAdapter adapt;

//ID variable used in Updating and Deleting Record

int ID = 0;
```

Step 3

Insert data in the database, as sgiven below.

```
if (txt_Name.Text != "" && txt_State.Text != "") {

    cmd = new SqlCommand("insert into tbl_Record(Name,State) values(@name, @state)", con);

    con.Open();

    cmd.Parameters.AddWithValue("@name", txt_Name.Text);

    cmd.Parameters.AddWithValue("@state", txt_State.Text);

    cmd.ExecuteNonQuery();

    con.Close();

    MessageBox.Show("Record Inserted Successfully");
```

```
        DisplayData();
        ClearData();
        } else {
        MessageBox.Show("Please Provide Details!");
        }
```

Step 4

Updating record is given below.

```
if (txt_Name.Text != "" && txt_State.Text != "") {
        cmd = new SqlCommand("update tbl_Record set Name=@name,State=@state where ID=@id", con);
        con.Open();
        cmd.Parameters.AddWithValue("@id", ID);
        cmd.Parameters.AddWithValue("@name", txt_Name.Text);
        cmd.Parameters.AddWithValue("@state", txt_State.Text);
        cmd.ExecuteNonQuery();
        MessageBox.Show("Record Updated Successfully");
        con.Close();
        DisplayData();
        ClearData();
        } else {
        MessageBox.Show("Please Select Record to Update");
        }
```

Step 5

Display record is shown below.

```
con.Open();
DataTable dt = new DataTable();
adapt = new SqlDataAdapter("select * from tbl_Record", con);
adapt.Fill(dt);
dataGridView1.DataSource = dt;
con.Close();
```

Step 6

Proceed, as shown below to delete the record.

```
if (ID != 0) {
    cmd = new SqlCommand("delete tbl_Record where ID=@id", con);
    con.Open();
    cmd.Parameters.AddWithValue("@id", ID);
    cmd.ExecuteNonQuery();
    con.Close();
    MessageBox.Show("Record Deleted Successfully!");
    DisplayData();
    ClearData();
    } else {
    MessageBox.Show("Please Select Record to Delete");
    }
}
```

Generate the Report using Crystal Report.

First create an Employee Data Table in your SQL Database.

Now, follow the steps for creating a Crystal Report.

Step 1

Create a table in the database. Create an Employee table in the database.

Command

```
create table Employee
(
Emp_ID int identity(1,1) constraint PK_Emp primary key,
Emp_Name varchar(30),
Emp_Contact nchar(15),
Emp_Salary decimal(7,2)
)
```

Now insert employee data into the Employee Table.

Command

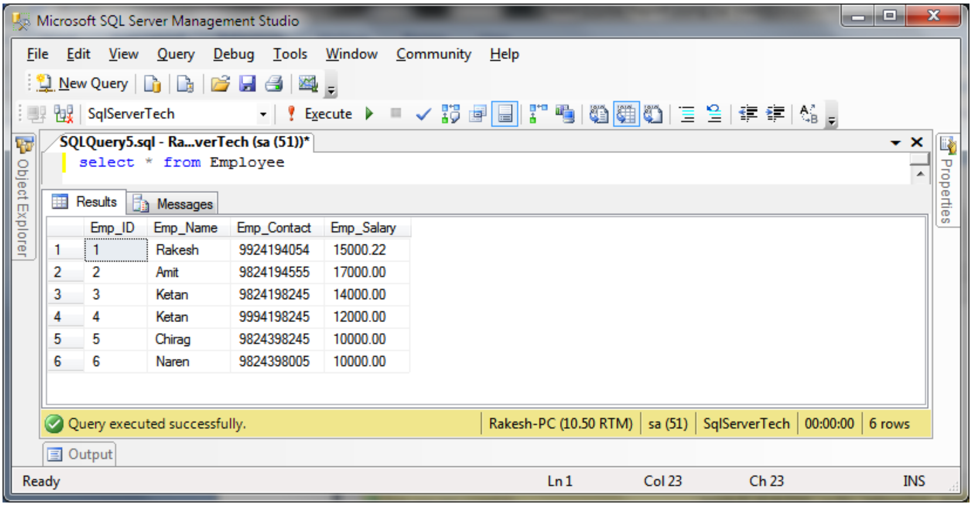
```
insert into Employee values ('Rakesh','9924194054','15000.22');
insert into Employee values ('Amit','9824194555','17000');
insert into Employee values ('Ketan','9824198245','14000');
insert into Employee values ('Ketan','9994198245','12000');
insert into Employee values ('Chirag','9824398245','10000');
insert into Employee values ('Naren','9824398005','10000');
```

Now Employee data has been inserted into the table.

Let's see it with a SQL Select Command Query in the SQL Database.

Command

```
Select * from Employee
```



Microsoft SQL Server Management Studio
File Edit View Query Debug Tools Window Community Help
New Query
SqlServerTech
Execute
SQLQuery5.sql - Ra...verTech (sa (51))*
Object Explorer
Properties
Results
Messages
Output

```
select * from Employee
```

	Emp_ID	Emp_Name	Emp_Contact	Emp_Salary
1	1	Rakesh	9924194054	15000.22
2	2	Amit	9824194555	17000.00
3	3	Ketan	9824198245	14000.00
4	4	Ketan	9994198245	12000.00
5	5	Chirag	9824398245	10000.00
6	6	Naren	9824398005	10000.00

```
Query executed successfully.    Rakesh-PC (10.50 RTM) | sa (51) | SqlServerTech | 00:00:00 | 6 rows
Ready    Ln 1    Col 23    Ch 23    INS
```

Step 2

Create a VIEW in your database to display employee data information.

Command

```
create view vw_Employee

as

Select Emp_ID,Emp_Name,Emp_Contact,Emp_Salary

from Employee

GO
```

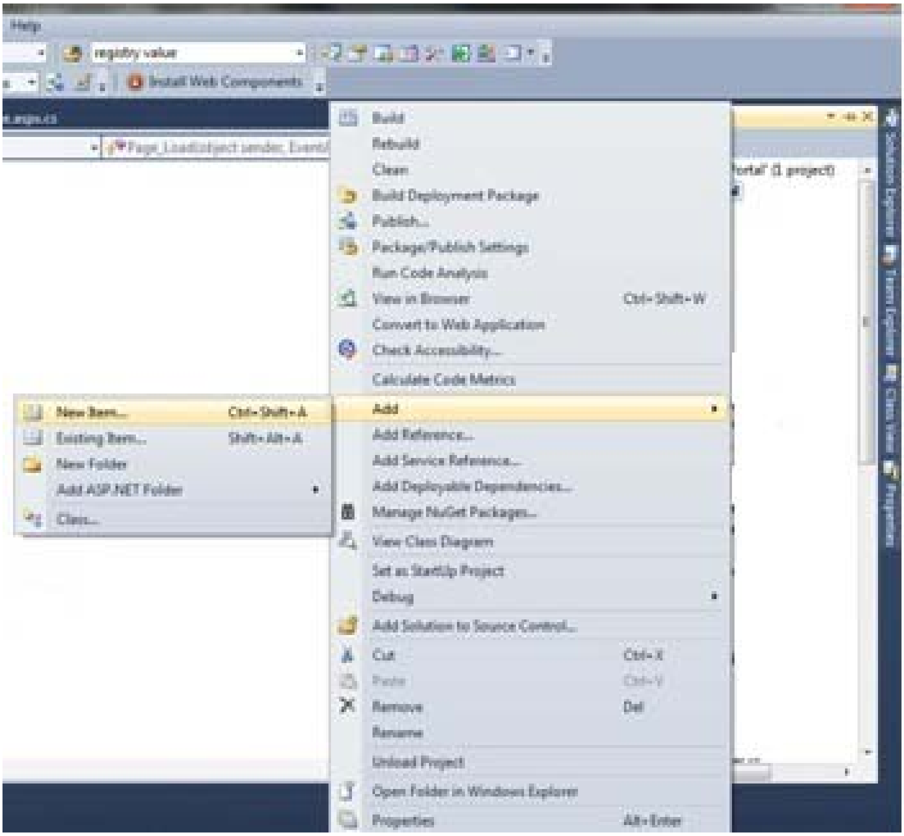
Now, your Employee database view has been created.

Step 3

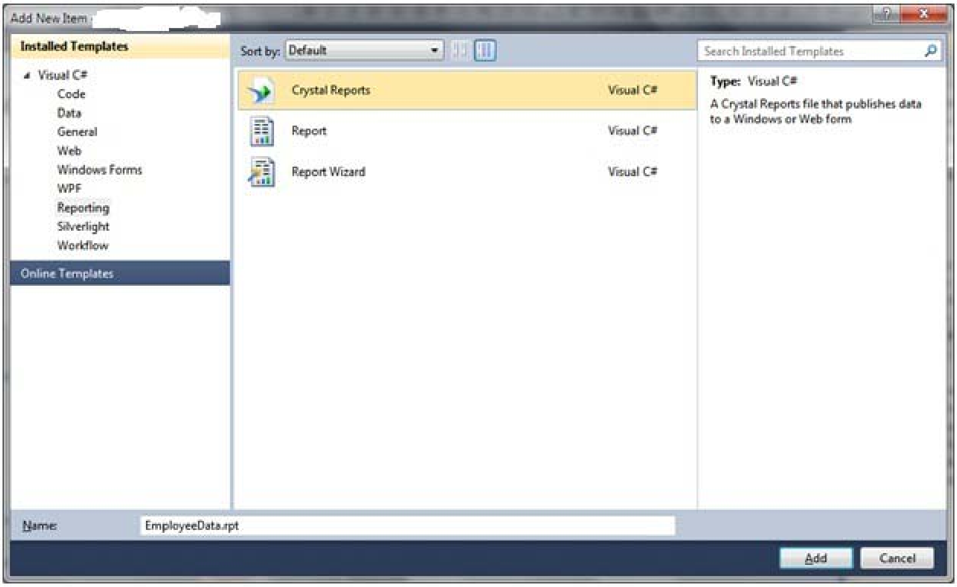
Go to Visual Studio.

Step 4

Go to the Solution Explorer and right-click on your project name and seelct Add -> New Item.



Step 5 Add New Item-> Crystal Report.



Sort by: Default

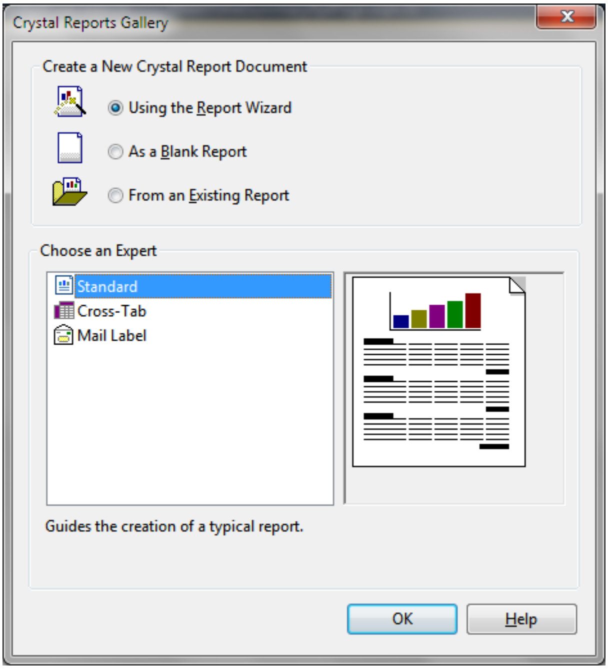
Type: Visual C#

A Crystal Reports file that publishes data to a Windows or Web form

Name: EmployeeData.rpt

Step 6

Click the Ok Button.



Crystal Reports Gallery

Create a New Crystal Report Document

● Using the Report Wizard

○ As a Blank Report

○ From an Existing Report

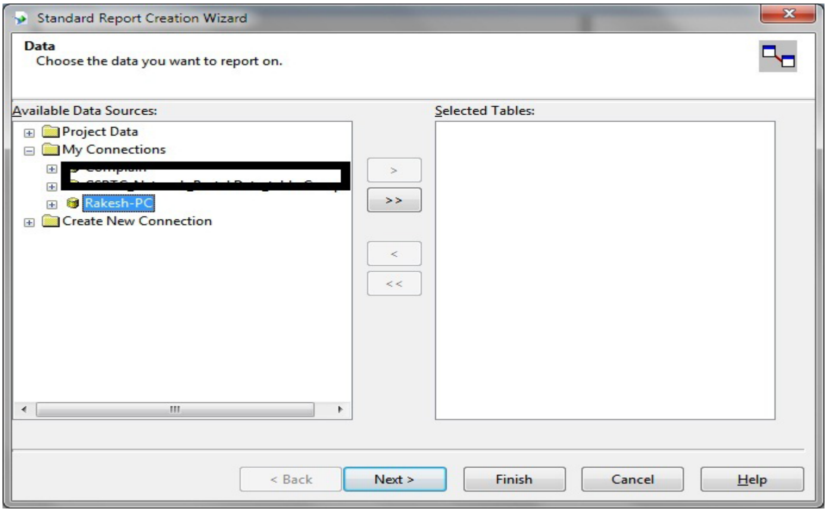
Choose an Expert

- Standard
- Cross-Tab
- Mail Label

Guides the creation of a typical report.

Step 7

Choose the data source as in the following:



Standard Report Creation Wizard

Data

Choose the data you want to report on.

Available Data Sources:

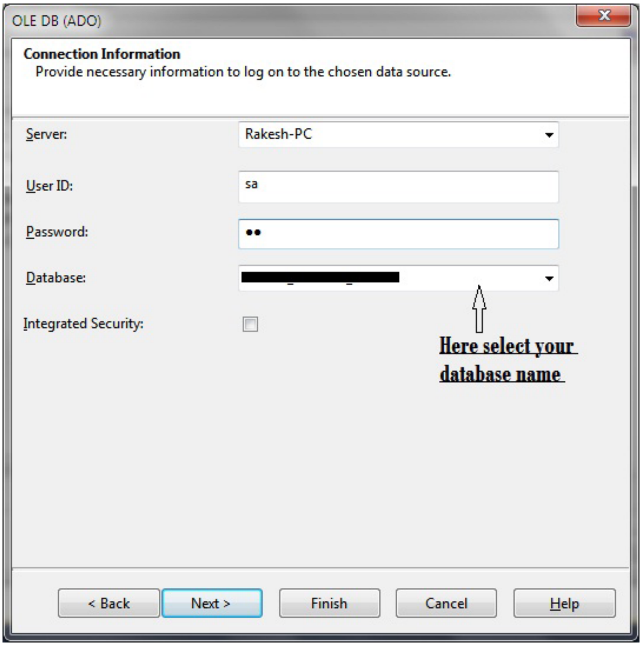
- Project Data
- My Connections
  - [redacted]
  - Rakesh-PC
- Create New Connection

Selected Tables:

Click the Next Button.

Step 8

Select the data with OLEDB (ADO) as in the following:



OLE DB (ADO)

Connection Information

Provide necessary information to log on to the chosen data source.

Server: Rakesh-PC

User ID: sa

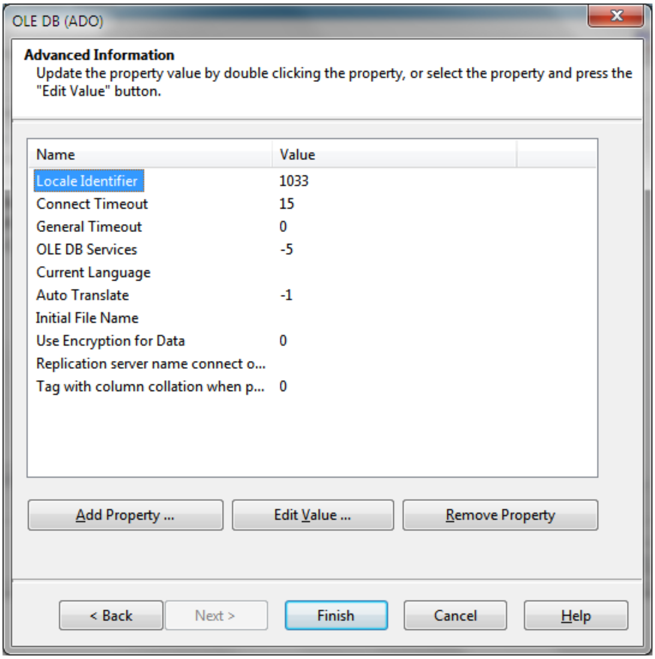
Password: ••

Database: [redacted]

Integrated Security: □

Here select your database name

Click the Next button to open a new dialog.



OLE DB (ADO)

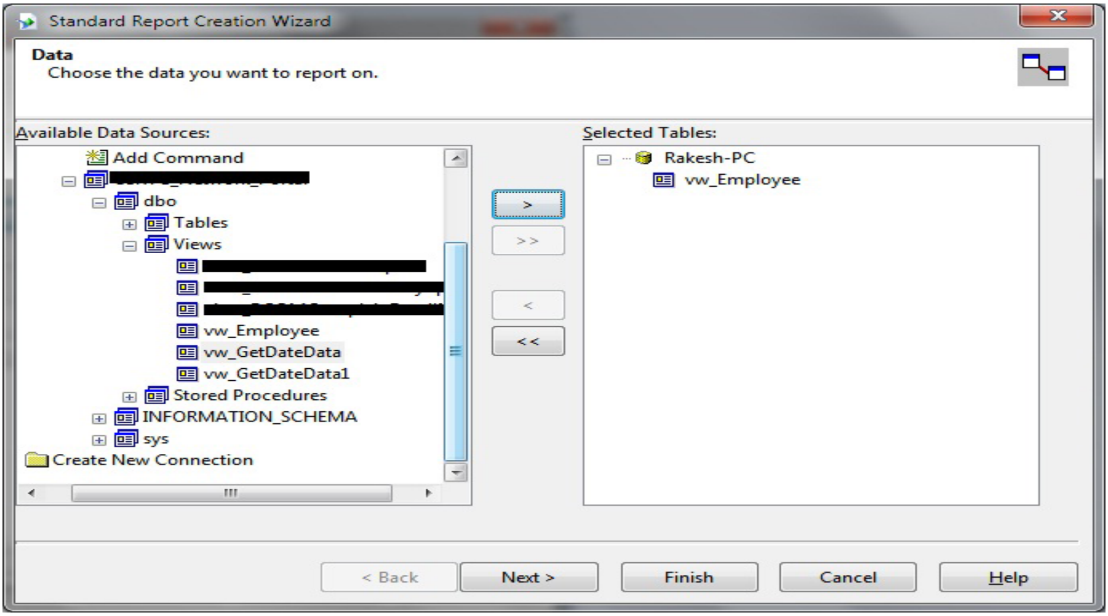
Advanced Information

Update the property value by double clicking the property, or select the property and press the "Edit Value" button.

Name	Value
Locale Identifier	1033
Connect Timeout	15
General Timeout	0
OLE DB Services	-5
Current Language	
Auto Translate	-1
Initial File Name	
Use Encryption for Data	0
Replication server name connect o...	
Tag with column collation when p...	0

Click the Finish button and open a new dialog box. In this, select your new view.

Step 9 : Select your view Employee view.



Standard Report Creation Wizard

Data

Choose the data you want to report on.

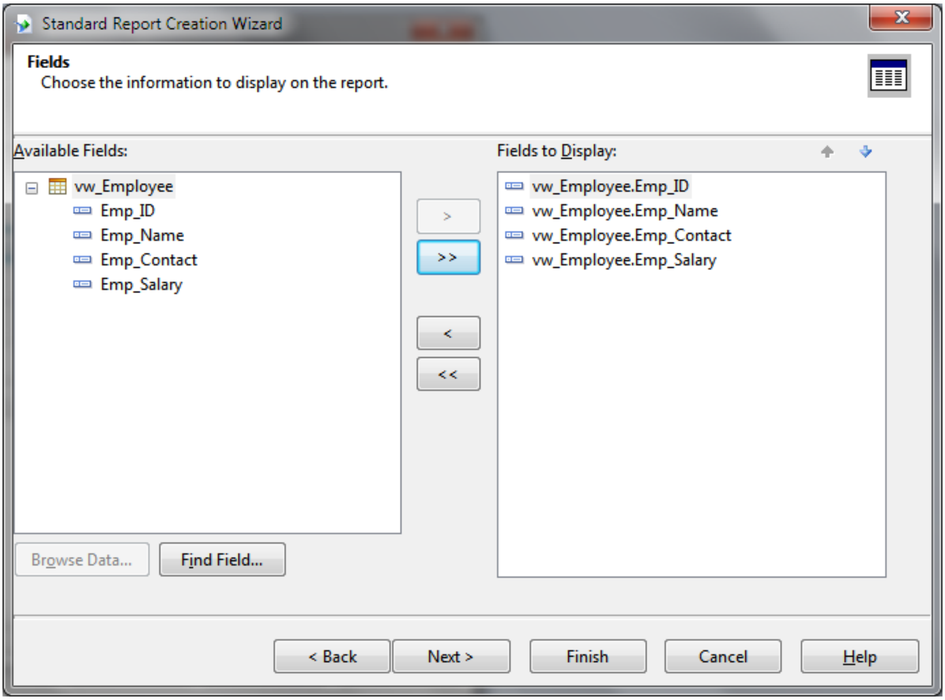
Available Data Sources:

- Add Command
- [redacted]
  - dbo
    - Tables
    - Views
      - [redacted]
      - vw_Employee
      - vw_GetDateData
      - vw_GetDateData1
    - Stored Procedures
  - INFORMATION_SCHEMA
  - sys
- Create New Connection

Selected Tables:

- Rakesh-PC
  - vw_Employee

Step 10 : Select the fields to display in the report area as in the following.



Standard Report Creation Wizard

Fields

Choose the information to display on the report.

Available Fields:

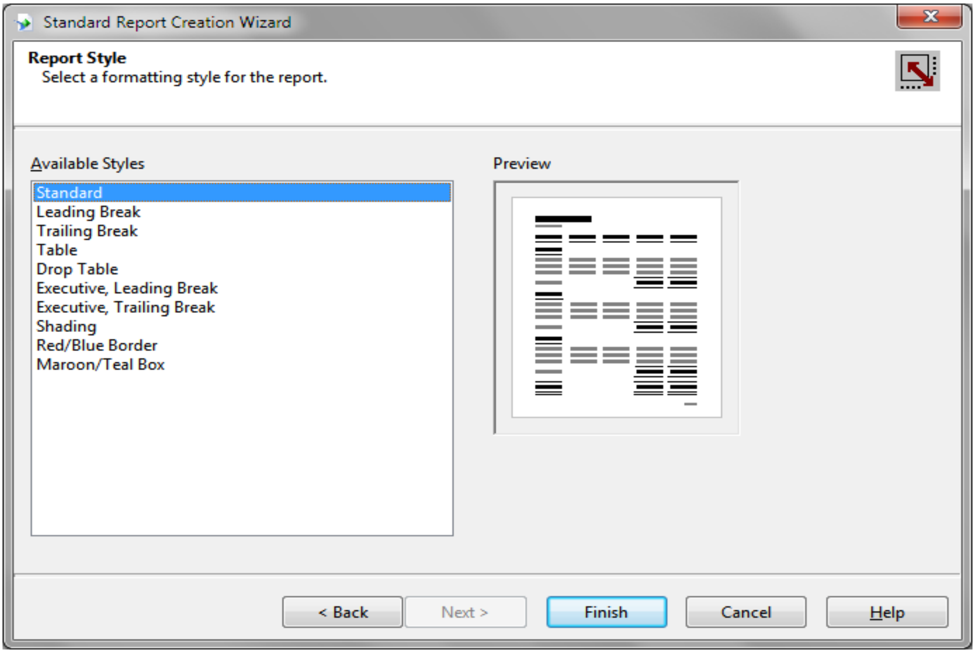
- vw_Employee
  - Emp_ID
  - Emp_Name
  - Emp_Contact
  - Emp_Salary

Fields to Display:

- vw_Employee.Emp_ID
- vw_Employee.Emp_Name
- vw_Employee.Emp_Contact
- vw_Employee.Emp_Salary

And click the Finish button.

Step 11: Select the report format as in the following:



Report Style

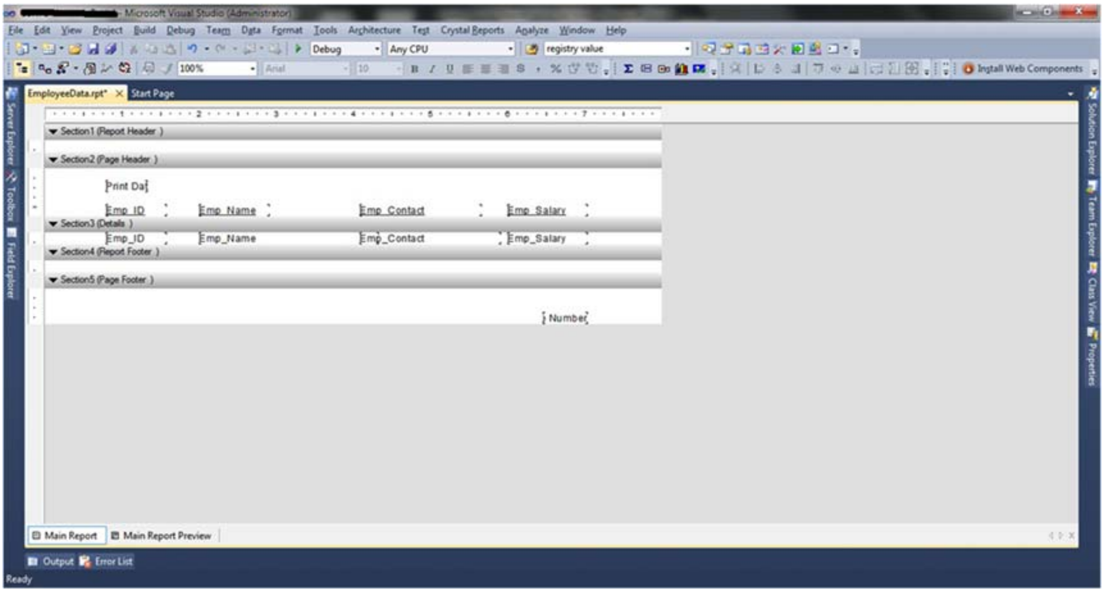
Select a formatting style for the report.

Available Styles

- Standard
- Leading Break
- Trailing Break
- Table
- Drop Table
- Executive, Leading Break
- Executive, Trailing Break
- Shading
- Red/Blue Border
- Maroon/Teal Box

Click the Finish Button after selecting the format of the report.

Step 12 : Now finally display your report in this format.



Section1 (Report Header)

Section2 (Page Header)

Print Dat

Emp_ID	Emp_Name	Emp_Contact	Emp_Salary

Section3 (Details)

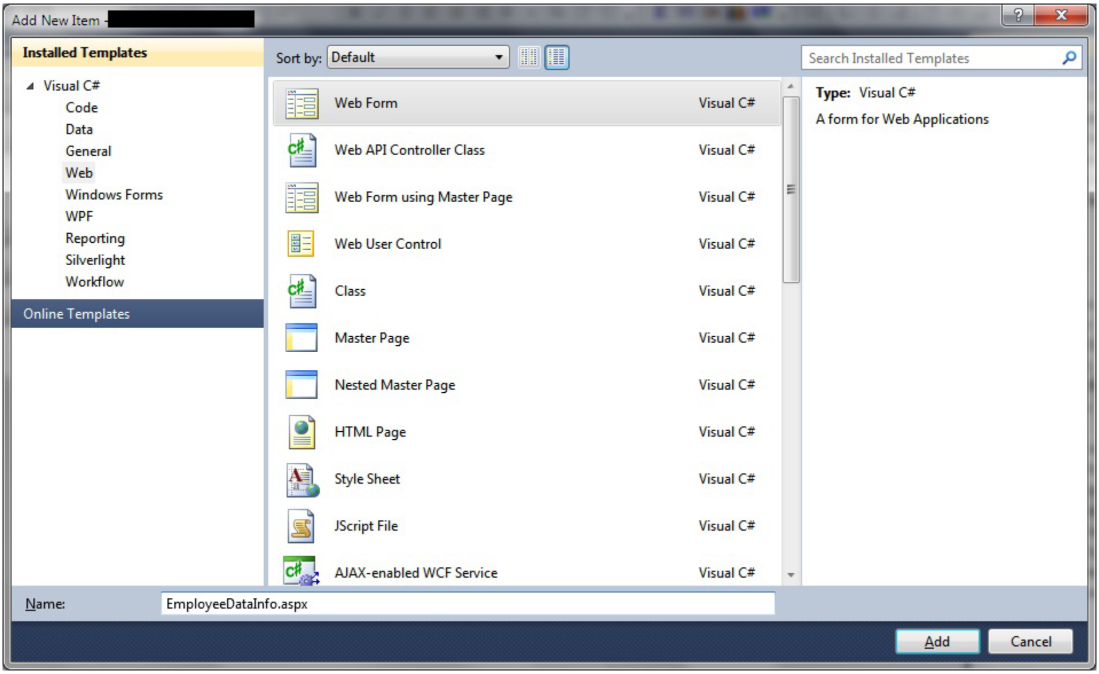
Emp_ID	Emp_Name	Emp_Contact	Emp_Salary

Section4 (Report Footer)

Section5 (Page Footer)

Number

Step 13: Now add a new .aspx page to display the report as in the following:



Add New Item - [redacted]

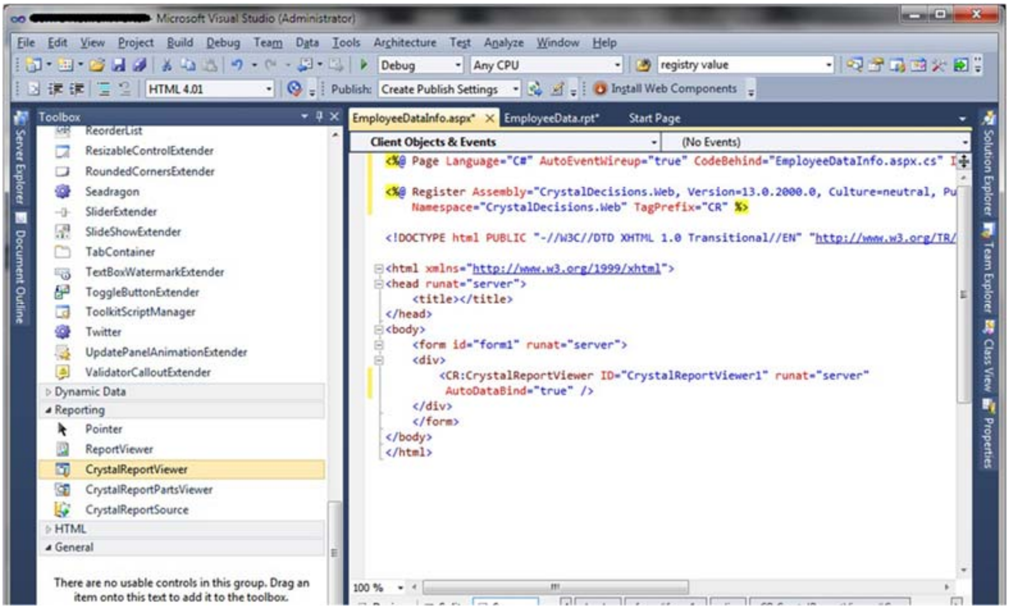
Type: Visual C#

A form for Web Applications

Name: EmployeeDataInfo.aspx

And provide the name EmployeeDataInfo.aspx.

Step 14 : Now add a Crystal Report Viewer to EmployeeDataInfo.aspx as shown in the following screeshot:

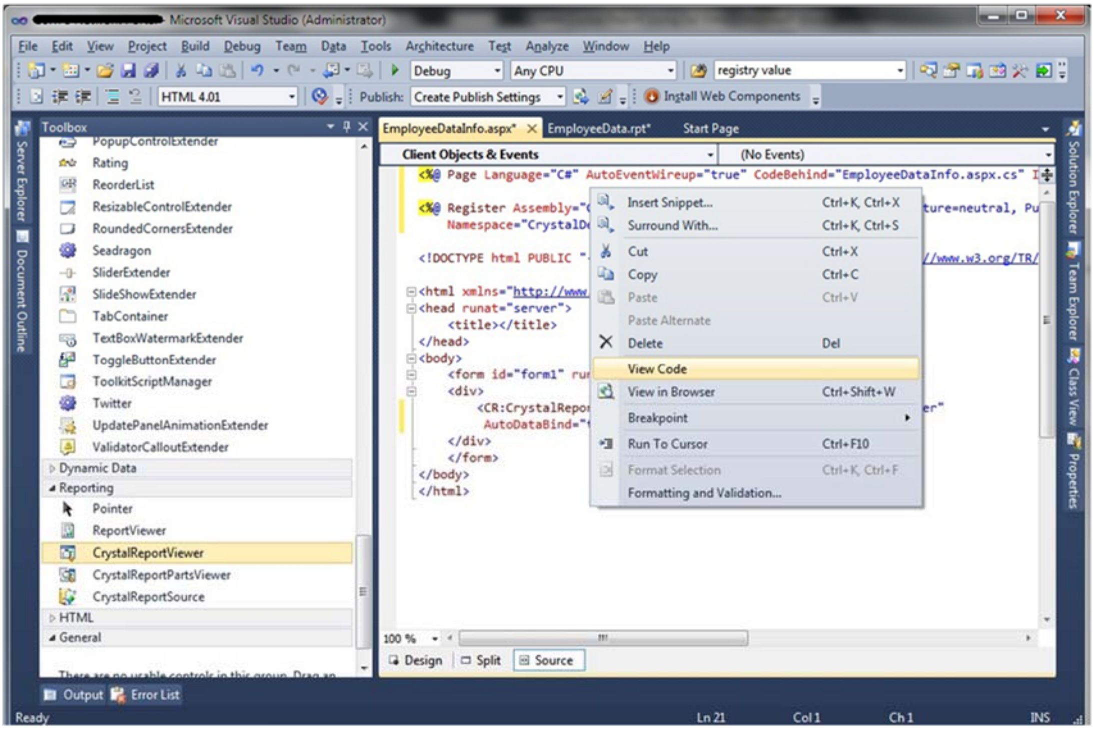


[redacted] Microsoft Visual Studio (Administrator)

```
<%@ Page Language="C#" AutoEventWireup="true" CodeBehind="EmployeeDataInfo.aspx.cs" I

<%@ Register Assembly="CrystalDecisions.Web, Version=13.0.2000.0, Culture=neutral, Pu
    Namespace="CrystalDecisions.Web" TagPrefix="CR" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/

<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
</head>
<body>
    <form id="form1" runat="server">
    <div>
        <CR:CrystalReportViewer ID="CrystalReportViewer1" runat="server"
         AutoDataBind="true" />
    </div>
    </form>
</body>
</html>
```

Step 15

Go to the aspx page code side as shown below:



```
<%@ Page Language="C#" AutoEventWireup="true" CodeBehind="EmployeeDataInfo.aspx.cs" I

<%@ Register Assembly="C                                       ture=neutral, Pu
    Namespace="CrystalDe

<!DOCTYPE html PUBLIC "-                                      //www.w3.org/TR/

<html xmlns="http://www.
<head runat="server">
    <title></title>
</head>
<body>
    <form id="form1" ru
    <div>
        <CR:CrystalRepor                                      er"
         AutoDataBind="t
    </div>
    </form>
</body>
</html>
```

Step 16

Write the report code in the .aspx.cs page as follows:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Web;

using System.Web.UI;

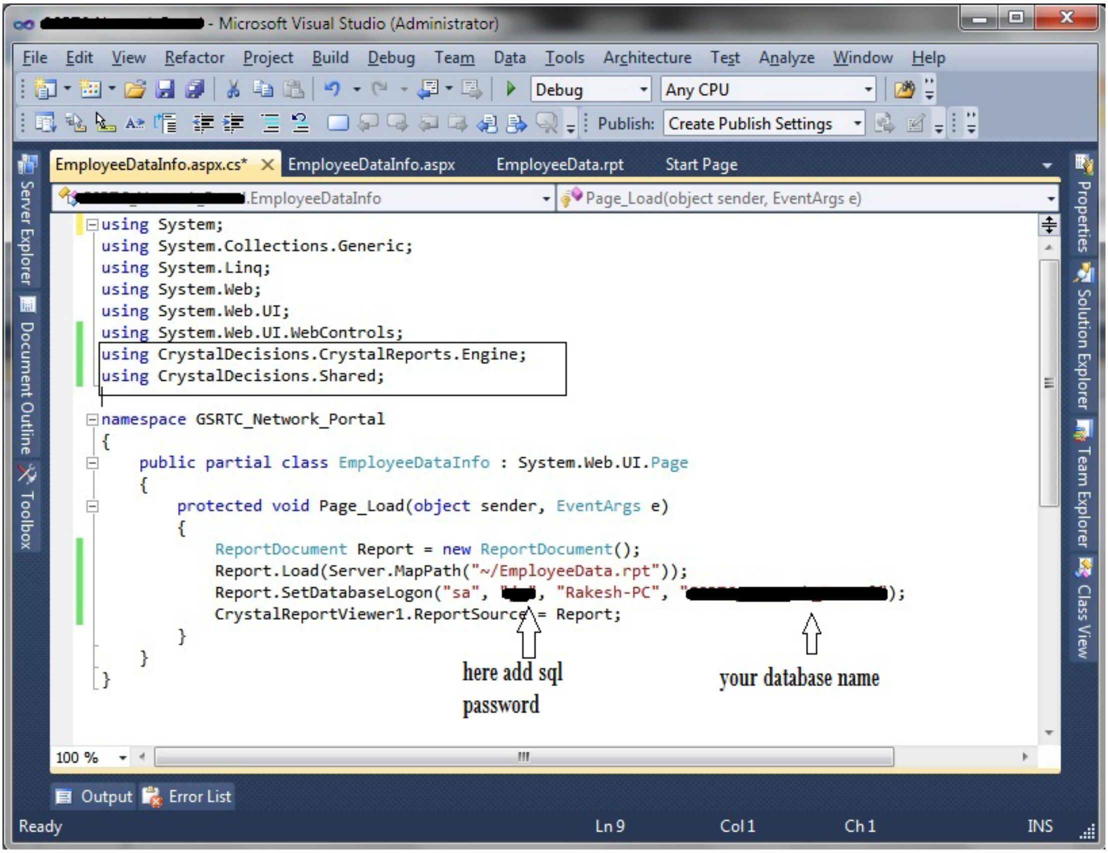
using System.Web.UI.WebControls;

using CrystalDecisions.CrystalReports.Engine;

using CrystalDecisions.Shared;

namespace Network_Portal {

```
    public partial class EmployeeDataInfo: System.Web.UI.Page {
        protected void Page_Load(object sender, EventArgs e) {
        ReportDocument Report = new ReportDocument();
        Report.Load(Server.MapPath("~/EmployeeData.rpt"));
        Report.SetDatabaseLogon("sa", "sa123", "Rakesh-PC", "RakeshData");
        CrystalReportViewer1.ReportSource = Report;
    }
    }
}
```

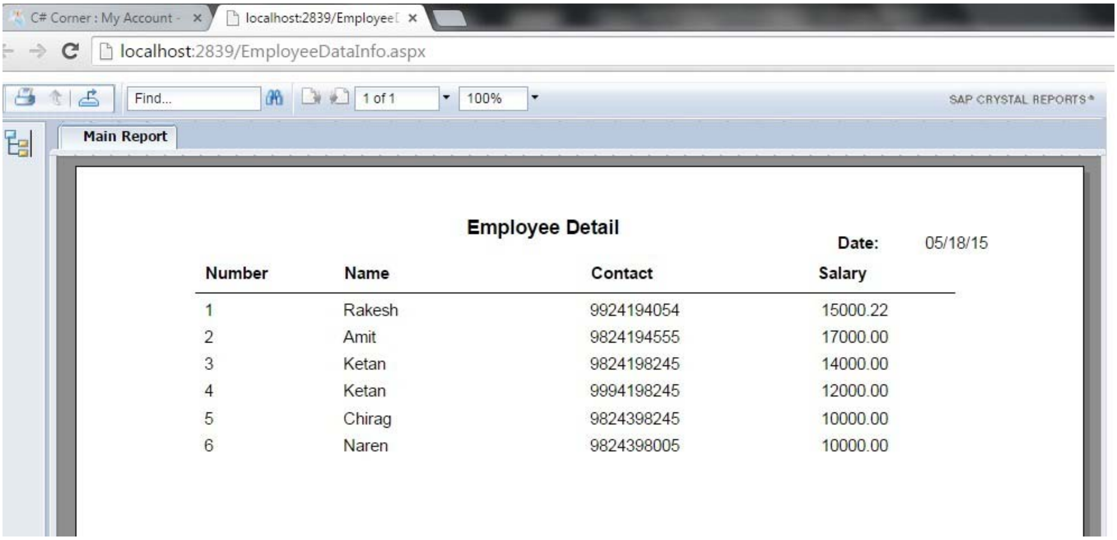

[redacted] - Microsoft Visual Studio (Administrator)
File Edit View Refactor Project Build Debug Team Data Tools Architecture Test Analyze Window Help
Debug
Any CPU
Publish: Create Publish Settings
EmployeeDataInfo.aspx.cs*
EmployeeDataInfo.aspx
EmployeeData.rpt
Start Page
[redacted].EmployeeDataInfo
Page_Load(object sender, EventArgs e)
Server Explorer
Document Outline
Toolbox
Properties
Solution Explorer
Team Explorer
Class View
100 %
Output
Error List
Ready
Ln 9
Col 1
Ch 1
INS

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
using System.Web.UI;
using System.Web.UI.WebControls;
using CrystalDecisions.CrystalReports.Engine;
using CrystalDecisions.Shared;

namespace GSRTC_Network_Portal
{
    public partial class EmployeeDataInfo : System.Web.UI.Page
    {
        protected void Page_Load(object sender, EventArgs e)
        {
            ReportDocument Report = new ReportDocument();
            Report.Load(Server.MapPath("~/EmployeeData.rpt"));
            Report.SetDatabaseLogon("sa", [redacted], "Rakesh-PC", "[redacted]");
            CrystalReportViewer1.ReportSource = Report;
        }
    }
}
```

here add sql password

your database name

Step 17 : Finally run your report and display the Employee Information.



Employee Detail

Date: 05/18/15

Number	Name	Contact	Salary
1	Rakesh	9924194054	15000.22
2	Amit	9824194555	17000.00
3	Ketan	9824198245	14000.00
4	Ketan	9994198245	12000.00
5	Chirag	9824398245	10000.00
6	Naren	9824398005	10000.00