

Visual Programming Languages

Lab Manual

[Fall/ Spring 20\_19\_]

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**LIST OF EXPERIMENTS**

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| --- | --- | --- | --- |
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| **3** | \_\_/\_\_/\_\_ | To study and implement object oriented programming concepts in C# |  |
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**Lab 1: To setup the environment and familiarize with C#**

The objective of this lab is to set up the Visual Studio environment and get some familiarity with the C# language.

Download and install Visual Studio .Net. Visual Studio is the leading platform powered by Microsoft for development on .net framework

**Lab Tasks:**

1. Write a small program in C# to print your CV.
2. Write a program to calculate whether an input number is even or odd.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

int a;

Console.WriteLine("enter any number:");

a = int.Parse(Console.ReadLine());

if (a % 2 == 0)

Console.WriteLine("number is even ");

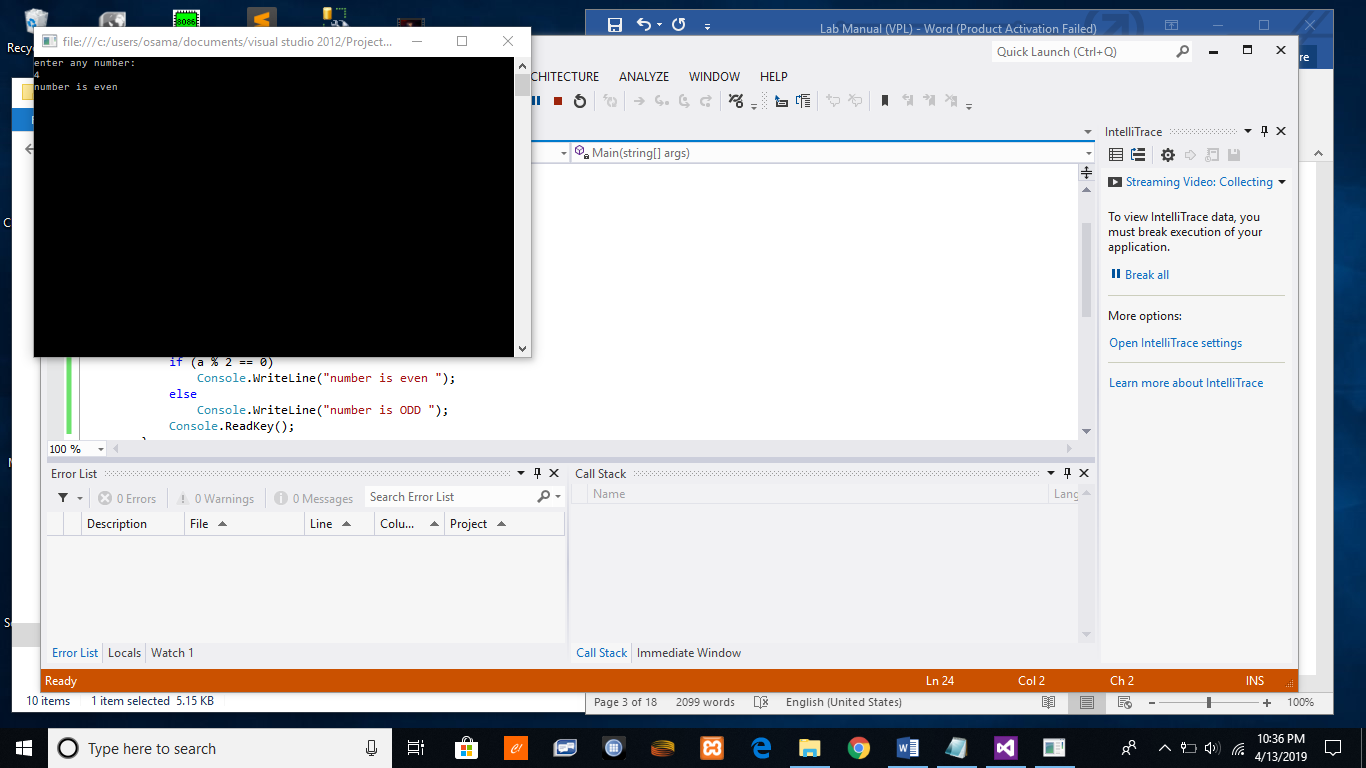
else

Console.WriteLine("number is ODD ");

Console.ReadKey(); }

}

}



1. Write a program that takes thee numbers from user as input. The program then prints the maximum and minimum of the input numbers.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

int no1;

int no2;

int no3;

Console.WriteLine("enter your first number:");

no1 = int.Parse(Console.ReadLine());

Console.WriteLine("enter your second number:");

no2 = int.Parse(Console.ReadLine());

Console.WriteLine("enter your second number:");

no3 = int.Parse(Console.ReadLine());

if (no1 > no2 && no1 > no3)

{

Console.WriteLine("no1 is greater" + no1);

}

else if (no2 > no3 && no2 > no1)

{

Console.WriteLine("no2 is greater" + no2);

}

else if (no3 > no1 && no3 > no2)

{

Console.WriteLine("no3 is greater" + no3); }

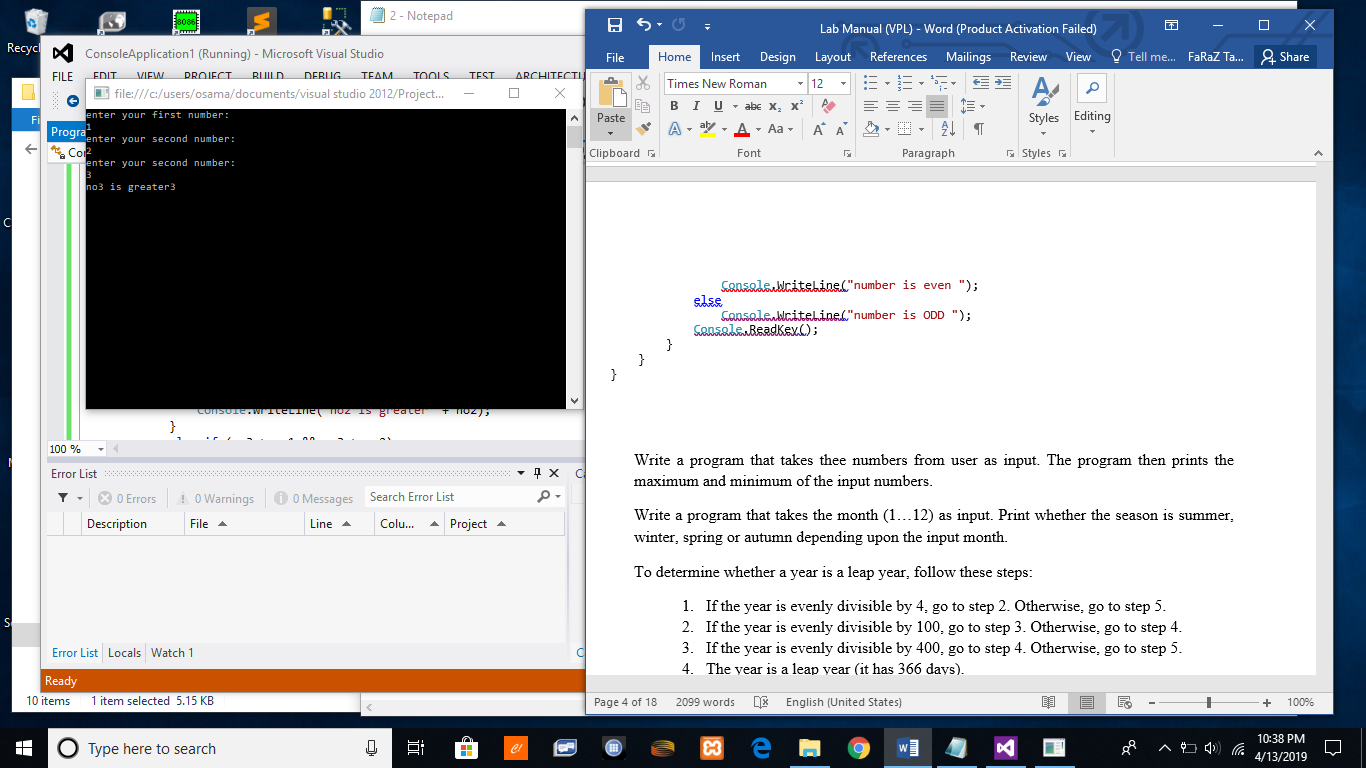
Console.ReadKey();

}

}

}

Screen Shot



1. Write a program that takes the month (1…12) as input. Print whether the season is summer, winter, spring or autumn depending upon the input month.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

int month;

Console.WriteLine("enter the month from 1-12");

month = int.Parse(Console.ReadLine());

if (month == 1 || month == 2 || month == 3 || month == 4)

{

Console.WriteLine("the season is winter");

}

if (month == 4 || month == 5)

{

Console.WriteLine("the season is summer");

}

if (month == 6 || month == 7 || month == 8)

{

Console.WriteLine("the season is spring");

}

if (month == 9 || month == 10 || month == 11 || month == 12)

{

Console.WriteLine("the season is autumn");

}

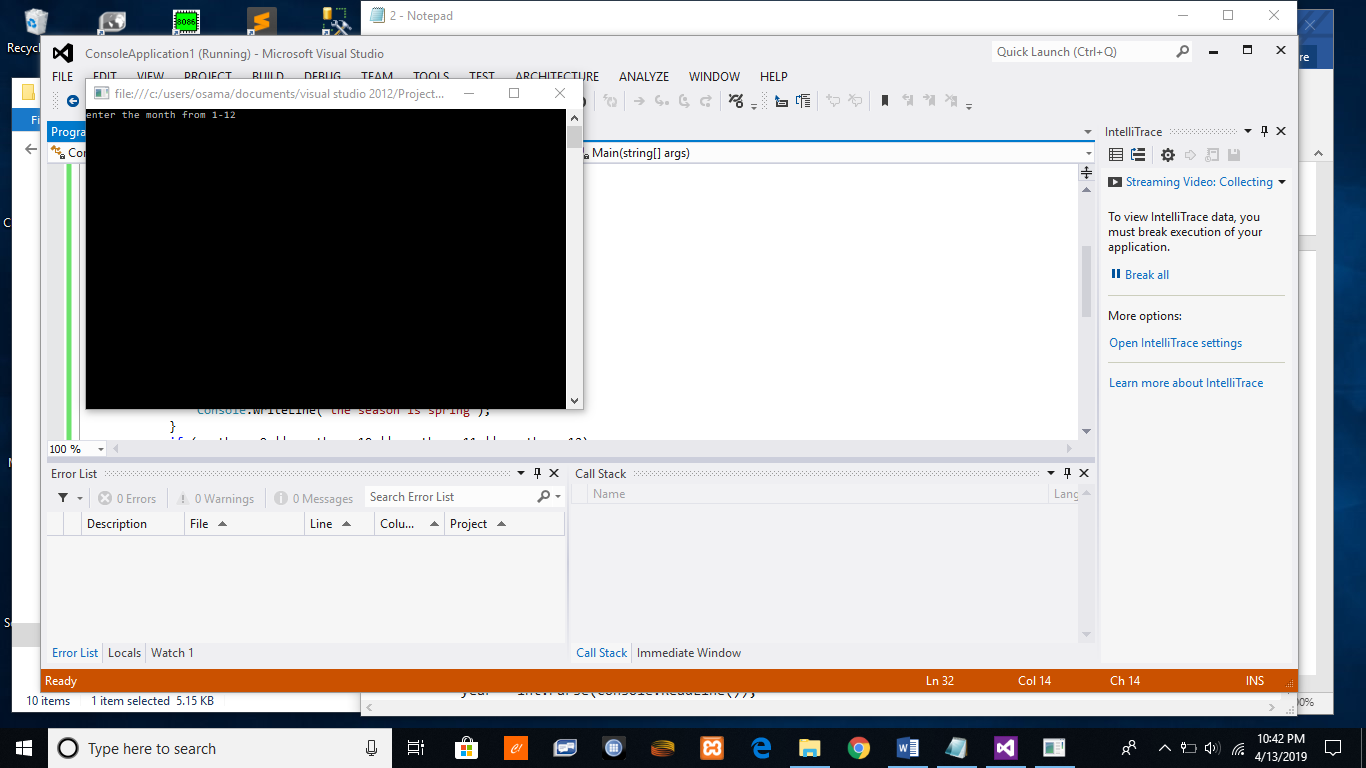
Console.ReadKey();

}

}

}

Screen Shot



1. To determine whether a year is a leap year, follow these steps:
   1. If the year is evenly divisible by 4, go to step 2. Otherwise, go to step 5.
   2. If the year is evenly divisible by 100, go to step 3. Otherwise, go to step 4.
   3. If the year is evenly divisible by 400, go to step 4. Otherwise, go to step 5.
   4. The year is a leap year (it has 366 days).
   5. The year is not a leap year (it has 365 days).

Write a program to input an year as integer. Using if…else, determines whether the input is a leap year or not.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

{

int year;

Console.WriteLine("enter the year");

year = int.Parse(Console.ReadLine());

if (year % 4 == 0)

{

if (year % 100 == 0)

{

Console.WriteLine("it is a leap year");

}

else

Console.WriteLine("it is not a leap year");

}

if (year % 4 == 0)

{

if (year % 100 == 0)

{

if (year % 400 == 0)

{

Console.WriteLine("it is a leapyear");

}

}

}

else

Console.WriteLine("its not a leap year");

}

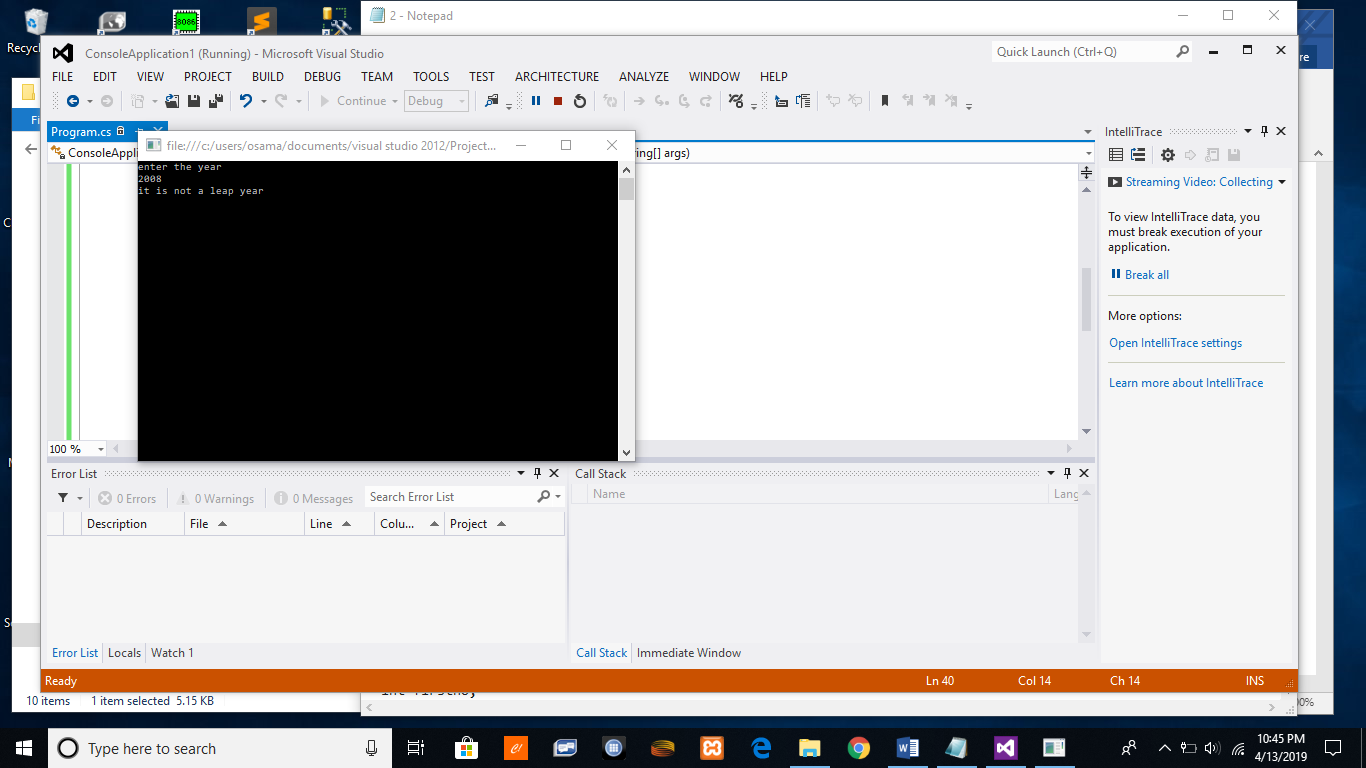
Console.ReadKey();

}

}

}

Screen Shot



1. Write a program that takes two numbers as input and an operator as input. Using the switch statement, the program should calculate the result when the operator is applied on the two input numbers.

Code:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

int firstno;

int secodno;

int total;

string op;

Console.WriteLine("enter your first number");

firstno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your second number");

secodno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your operator");

op = Console.ReadLine();

switch (op)

{

case "+": total = firstno + secodno;

Console.WriteLine("result=" + total);

break;

case "-": total = firstno - secodno;

Console.WriteLine("result=" + total);

break;

case "\*": total = firstno \* secodno;

Console.WriteLine("result=" + total);

break;

case "/": total = firstno / secodno;

Console.WriteLine("result=" + total);

break;

}

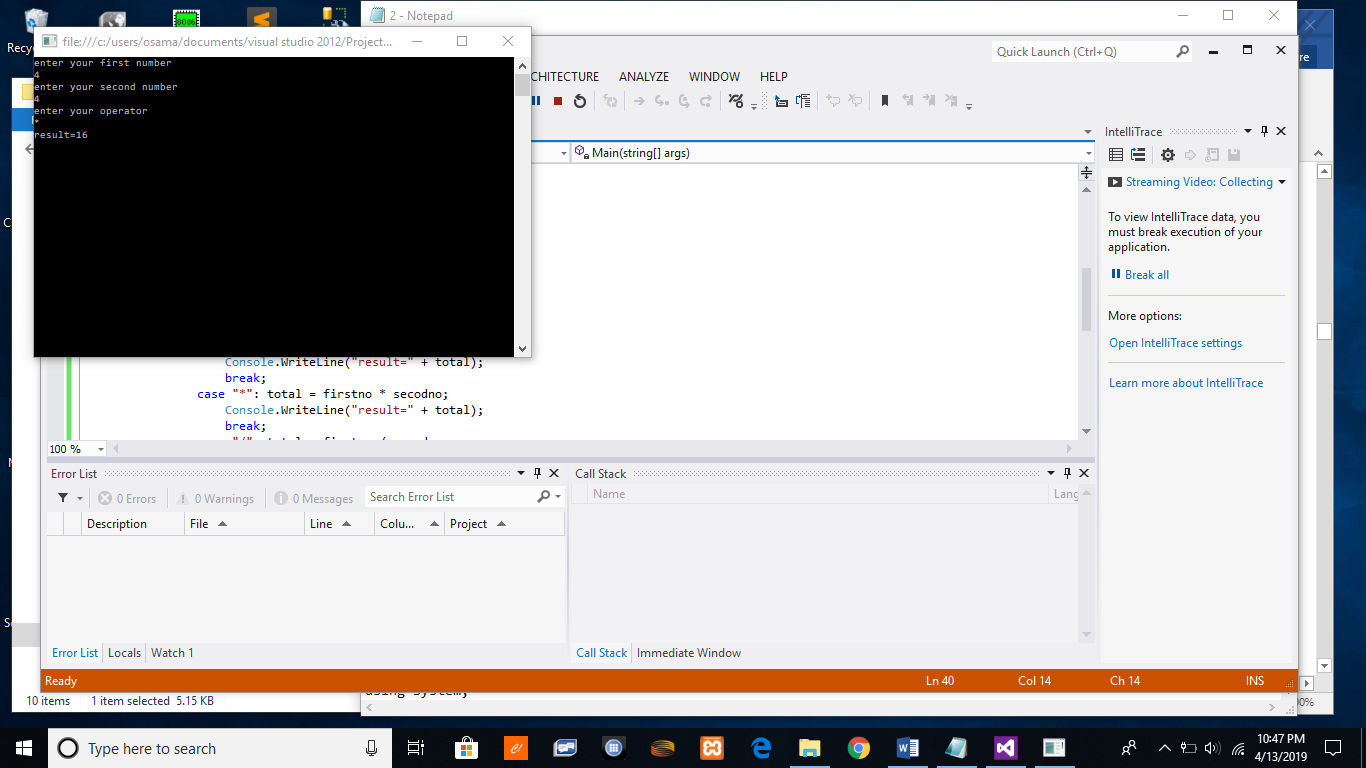
Console.ReadKey();

}

}

}

Screen Shot



1. Write a program to print Iqra University marks sheet using if…else statement

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication1

{

class Program

{

static void Main(string[] args)

{

{

float firstno;

float secodno;

float thirdno;

float fourthno;

float fifthno;

float total;

float PER;

Console.WriteLine("enter your marks in computer programming");

firstno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your marks in VPL");

secodno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your marks in WPL");

thirdno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your marks in MP");

fourthno = int.Parse(Console.ReadLine());

Console.WriteLine("enter your marks in OS");

fifthno = int.Parse(Console.ReadLine());

Console.WriteLine("Marksheet");

Console.WriteLine("CP:"+firstno);

Console.WriteLine("VPL:"+secodno);

Console.WriteLine("WPL:"+thirdno);

Console.WriteLine("MP:"+fourthno);

Console.WriteLine("OS:"+fifthno);

total = firstno + secodno + thirdno + fourthno + fifthno;

Console.WriteLine("TOTAL MARKS "+ total +" OUT OF 500");

PER = (total / 500) \* 100;

Console.WriteLine("PERCENTAGE="+PER);

}

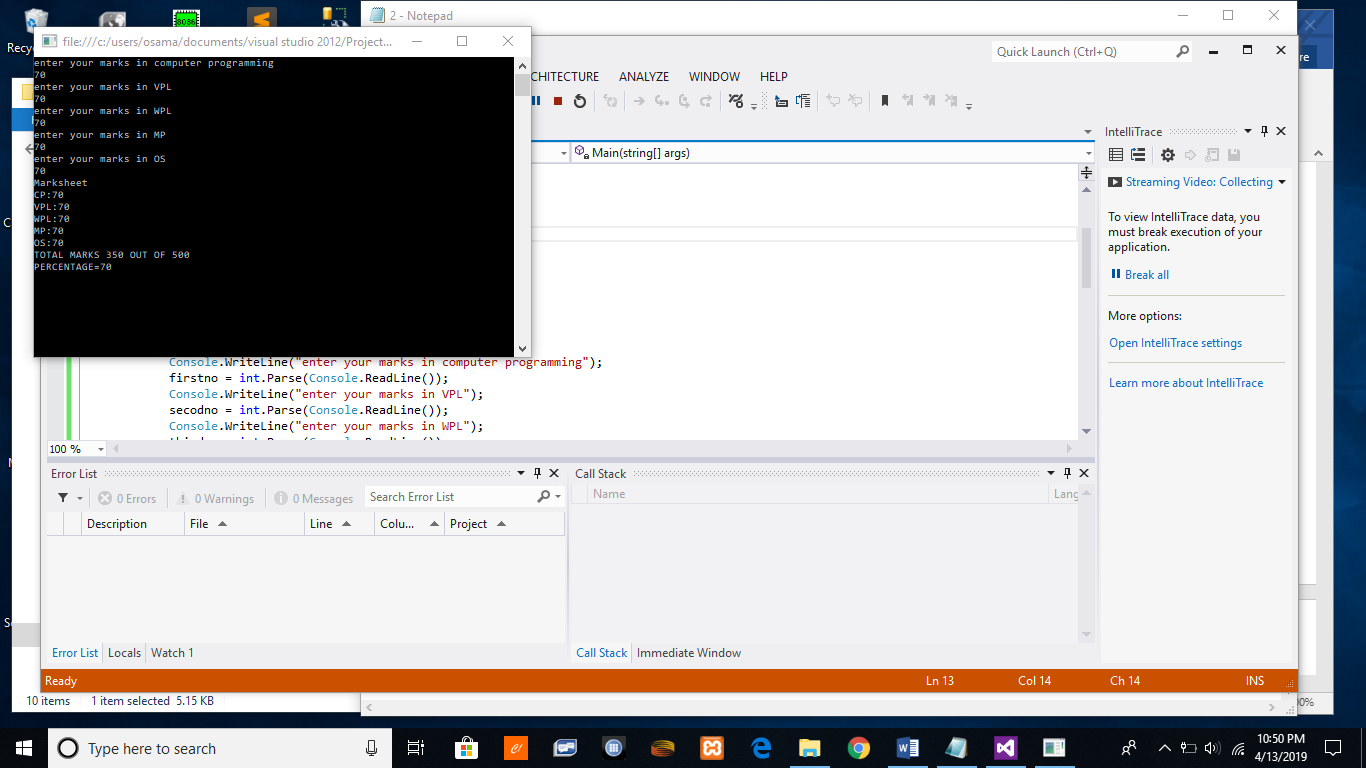
Console.ReadKey();

}

}

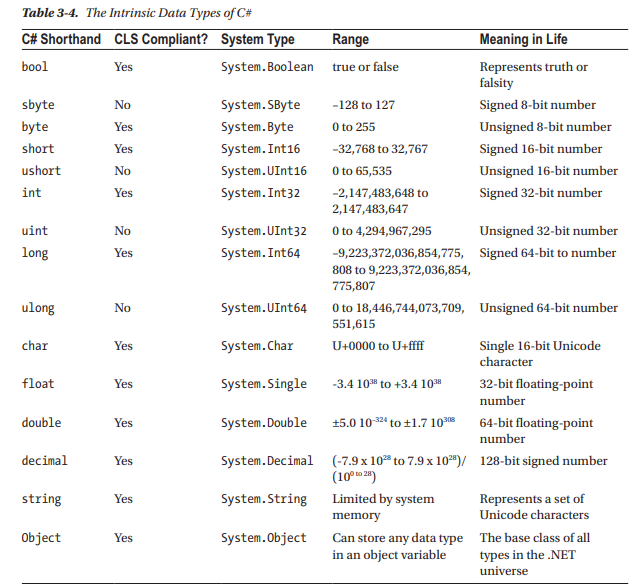
}

Screen Shot

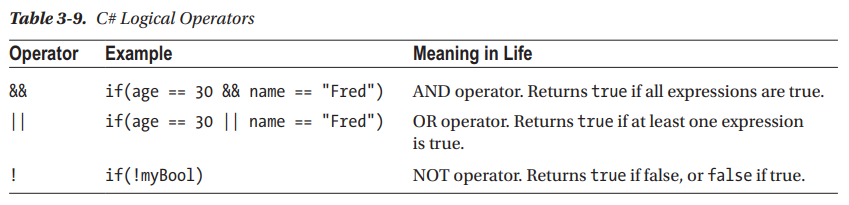


**Lab 2: To study and understand how to write programs in C# using loops, arrays and other constructs**

The objective of this lab is to start writing programs in C# using its basic constructs such as loops, conditions, arrays etc. Following are intrinsic data types supported by C#.



Following are the logical operators in C#:



Loops are used in situations when we need to execute a block of code several number of times. C# has four types of loops: for, foreach, while and do while. An array is a collection of homogeneous data elements. You can declare an array of int as follows:

int[] myInts = new int[3];

**Lab Tasks:**

1. Write a program to count the frequency of each element of an array.

Code:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication8

{

class Program

{

static void Main(string[] args)

{

int[] x = { 3, 5, 6, 7, 8, 9, 7 };

// distinct for reoccuring

foreach (int i in x.Distinct().ToArray())

{

int c = 0;

foreach (int j in x)

{

if (i == j)

{

c++;

}

}

Console.WriteLine(i + "comes" + c + "times");

}

}

}

}

1. Write a program to find maximum and minimum element in an array.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

import java.util.Arrays;

import java.util.Collections;

namespace ConsoleApplication9

{

class Program

{

static void Main(string[] args)

{

Integer[] A = { 6, 8, 3, 5, 1, 9 };

List<Integer> ints = Arrays.asList(A);

Console.WriteLine("Min element is " + Collections.min(ints));

Console.WrileLine("Max element is " + Collections.max(ints));

}

}

}

1. Write a program to separate odd and even integers in separate array

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication8

{

class Program

{

static void Main(string[] args)

{

int[] arr1 = new int[] { 77,34,59,42,99 };

int[] arr2 = new int[5];

int[] arr3 = new int[5];

int i, j = 0, k = 0;

for (i = 0; i < 5; i++) {

if (arr1[i] % 2 == 0) {

arr2[j] = arr1[i];

j++;

} else {

arr3[k] = arr1[i];

k++;

}

}

Console.WriteLine("Even numbers...");

for (i = 0; i < j; i++) {

Console.WriteLine(arr2[i]);

}

Console.WriteLine("Odd numbers...");

for (i = 0; i < k; i++) {

Console.WriteLine(arr3[i]);

}

}

}

}

1. Write a program to find the length of a string without using library function.

Code

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication8

{

class Program

{

static void Main(string[] args)

{

string str;

int length = 0;

Console.Write("Input the string : ");

str = Console.ReadLine();

foreach (char chr in str)

{

length += 1;

}

Console.Write("Length of the string is : {0}\n\n", length);

Console.ReadLine();

}

}

}

1. Write a program to count the total number of words in a string.

Code:

static void Main(string[] args)

{

String s = "welcome to Iqra University";

int count = 1;

for (int i = 0; i < s.length() - 1; i++)

{

if ((s.charAt(i) == ' ') && (s.charAt(i + 1) != ' '))

{

count++;

}

}

Console.WriteLine("Number of words string = " + count);

}

}

}

1. Write a program to create a recursive function to calculate the Fibonacci number of a specific term.

Code:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

namespace ConsoleApplication14

{

class Program

{

static int fib(int n)

{

if (n <= 1)

return n;

return fib(n - 1) + fib(n - 2);

}

static void Main(string[] args)

{

int n = 9;

Console.WriteLine(fib(n));

}

}

}

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

namespace ConsoleApplication17

{

class Program

{

public static int Fib(int n)

{

if (n <= 1)

{

return n;

}

else

{

return Fib(n - 1) + Fib(n - 2);

}

}

static void Main(string[] args)

{

int n = 9;

Console.Write(Fib(n));

**Lab 3: To study and implement object oriented programming concepts in C#**

Object-oriented programming (OOP) refers to a type of computer programming (software design) in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure. In this lab, we are going to implement the three basic pillars of OOP i.e. encapsulation, inheritance and polymorphism.

**Tasks:**

1. Encapsulation
   * + 1. Create a class Circle.
       2. Define a property named radius. In the set method, check if the radius is negative then throw an exception System.ArgumentException.



namespace ConsoleApplication18

{

class circle

{

private float r;

public float radius

{

get

{

return r;

}

set

{

if (value < 0)

throw new ArgumentException("Invalid radius");

}

}

}

}

* + - 1. Define a one argument constructor to initialize the radius.

class circle

{

public circle(float radius)

{

this.radius = radius;

}

public circle()

: this(0)

{

}

* + - 1. Define a no argument constructor to initialize the radius value to zero using constructor chaining.

class Program

{

static void Main(string[] args)

{

circle c = new circle();

c.radius = 9;

Console.Write(c.radius);

}

}

}

* + - 1. Define a method GetArea() to calculate the area of circle.

public float GetArea(){

return 3.14f\* radius \*radius;

}

}

}

Main class

Console.WriteLine(c.GetArea());

}

* + - 1. Create a Test class.

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

namespace ConsoleApplication18

{

class test

{

}

}

* + - 1. In the Main method, define two objects of Circle and initialize them with random values.

static void Main(string[] args)

{

circle c = new circle();

c.radius = 9;

Console.Write(c.radius);

}

}

}

* + - 1. Call the GetArea() method of each object and print the area.

static void Main(string[] args)

{

circle c = new circle();

c.radius = 9;

Console.Write(c.radius);

}

}

}

1. Inheritance/ Polymorphism
   * + 1. Create an abstract class Animal. Define a property: name of type string. Define an abstract method sound(). Define a constructor to initialize the animal’s name.
       2. Now define two abstract classes named Mammal and Non-Mammal that inherits the Animal class.
       3. Inherit the Mammal class to define Cat class. Implement the method sound that prints ‘Meow’.
       4. Implement classes for the Goat inheriting the Mammal and the Fish inheriting the Non-Mammal class
       5. Create a Test class. Define few objects of classes Cat, Goat and Fish. Assign the instance variables to reference variable of Animal class and polymorphically call them.

Solution For A To E

class Animal

{

protected boolean isMammal;

protected boolean isCarnivorous;

public Animal(boolean isMammal, boolean isCarnivorous) {

this.isMammal = isMammal;

this.isCarnivorous = isCarnivorous;

}

public boolean getIsMammal() {

return this.isMammal;

}

public boolean getIsCarnivorous() {

return this.isCarnivorous;

}

abstract public String getGreeting();

public void printAnimal(String name) {

Console.Write("A " + name + " says '" + this.getGreeting() + "', is " + (this.getIsCarnivorous() ? "" : "not ")

+ "carnivorous, and is " + (this.getIsMammal() ? "" : "not ") + "a mammal.");

}

}

class goat : Animal{

public goat() {

super(true, true);

}

public String getGreeting() {

return "mee";

}

}

class Cat : Animal{

public Cat() {

super(true, false);

}

public String getGreeting() {

return "meewoo";

}

}

class fish : Animal{

public fish() {

super(false, false);

}

public String getGreeting() {

return "zzzzzz";

}

}

public class AnimalInheritance{

public static void main(String[] args) {

Animal cat = new cat();

cat.printAnimal("cat");

Animal goat = new goat();

goat.printAnimal("g");

Animal fish = new fish();

fish.printAnimal("fish");

}

}

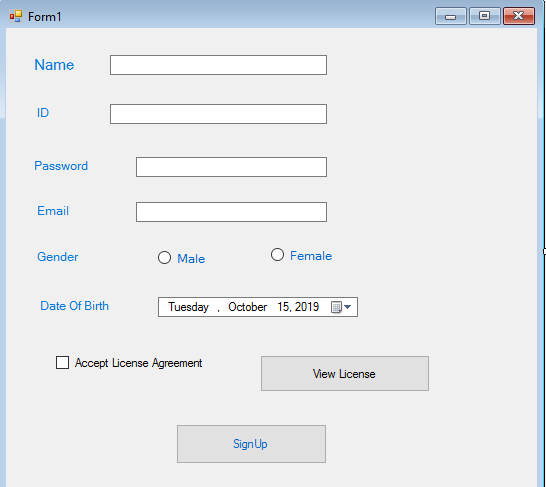
**Lab 4: To study and implement Windows Forms application in C#**

In this lab we will implement windows forms in C#. Windows Forms (WinForms) is a graphical (GUI) class library included as a part of Microsoft .NET Framework or Mono Framework, providing a platform to write rich client applications for desktop, laptop, and tablet PCs.

We will look at some of the most common controls used in C# and use them to develop a basic application.

**Tasks:**

1. Design a basic Sign Up form with fields name, id, password, email, address, gender and date of birth.
2. Add a checkbox to accept license agreement, and a view button to view the license agreement.
3. Add a Sign Up button.
4. When the user clicks on Sign Up, following validations are to be performed:
   1. Password must contain a capital letter and one digit
   2. Email address should be in proper format
   3. All the fields must be filled by user
   4. The user must be 18 years or above
   5. The user has accepted the license agreement
5. When the user clicks on view license agreement button, a new form is to be displayed with the license agreement.



private void button1\_Click(object sender, EventArgs e)

{

string name = user\_name.Text;

string id = this.id.Text;

string email = this.email.Text;

string dob = this.dob.Text;

string pass = this.pass.Text;

string gender = "Male";

if (this.female.Checked)

{

gender = "female";

}

else if(this.male.Checked){

gender = "male";

}

bool license = this.lic.Checked;

if(name == "" ||

id == "" ||

email == ""||

dob == ""||

pass == "" ||

license == false )

{

MessageBox.Show("please fill all the box");

return;

}

if(!email.Contains("@") ||

!email.Contains("."))

{

MessageBox.Show("please provide a valid email");

return;

}

}

private void button1\_Click(object sender, EventArgs e)

{

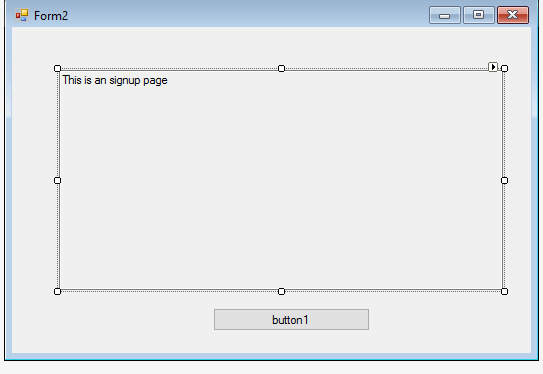
Form2 f = new Form2();

f.Show();

}

}

}



private void button1\_Click(object sender, EventArgs e)

{

this.Close();

}

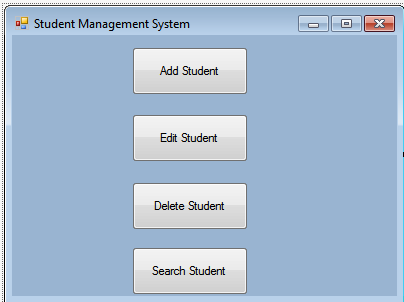
**Lab 5: To study and implement Collections in C#**

In todays, lab we will implement the collections in C#. A collection is an abstract data type for grouping together multiple values. It's therefore sometime known as container. A collection is just a grouping of some objects with the same type.

**Lab Tasks:**

1. Create a WinForm in C# with following buttons: Add a Student, Edit a Student, Delete a Student, Search a Student.
2. Now, create a class Student with the following properties: name, age, gender, cgpa
3. Implement the Add a Student button. When the user clicks this button, open a new form from which user can provide the details. Save the results in a collection.
4. Implement the Edit button such that user can modify the students record. The changes are reflected in the collection.
5. Implement the Delete and Search options.

CODE:



public partial class Form1 : Form

{

private List<Student> students = new List<Student>();

public Form1()

{

InitializeComponent();

}

private void button1\_Click(object sender, EventArgs e) //add

{

AddStudent add = new AddStudent(students);

add.Show();

}

private void Form1\_Load(object sender, EventArgs e)

{

Student s1 = new Student();

s1.name = "Ali";

s1.gender = "Male";

s1.age = 21;

s1.cgpa = 3.6f;

students.Add(s1);

s1 = new Student();

s1.name = "Areeba";

s1.gender = "Female";

s1.age = 20;

s1.cgpa = 3.2f;

students.Add(s1);

}

private void button2\_Click(object sender, EventArgs e) //Edit

{

ListStudent ls = new ListStudent(this.students);

ls.select\_edit();

ls.Show();

}

private void button4\_Click(object sender, EventArgs e) //Delete

{

ListStudent ls = new ListStudent(this.students);

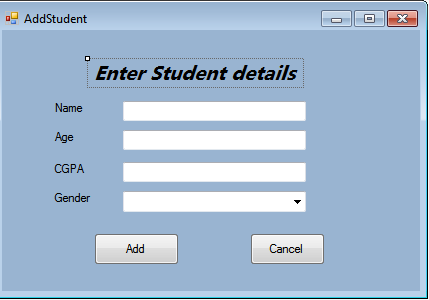
ls.select\_delete();

ls.Show();

}

}

}



public partial class AddStudent : Form

{

private List<Student> students;

public AddStudent(List<Student> students)

{

this.students = students;

InitializeComponent();

}

private void button1\_Click(object sender, EventArgs e) //CANCEL

{

this.Close();

}

private void button2\_Click(object sender, EventArgs e) //ADD

{

Student s = new Student();

s.name = this.sname.Text;

s.age = int.Parse(this.age.Text);

s.cgpa = float.Parse(this.cgpa.Text);

s.gender = this.gender.SelectedText;

students.Add(s);

MessageBox.Show("Student added successfully");

this.Close();

}

}

}

STUDENT CLASS

public class Student

{

public string name { get; set; }

public int age { get; set; }

public float cgpa { get; set; }

public string gender { get; set; }

public override String ToString()

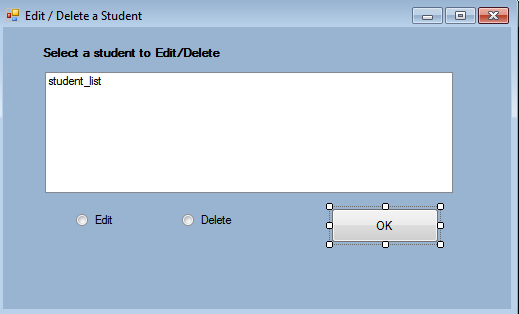
{

return name;

}

}

}



public partial class ListStudent : Form

{

List<Student> students;

public ListStudent(List<Student> students)

{

this.students = students;

InitializeComponent();

}

private void ListStudent\_Load(object sender, EventArgs e)

{

this.student\_list.DataSource = this.students;

}

public void select\_edit()

{

this.Edit.Checked = true;

}

public void select\_delete()

{

this.Delete.Checked = true;

}

**Lab 6: To study and implement I/O in C#**

In this lab, we will use StreamReader and StreamWriter of C# to develop a basic application that can insert student’s records in a file. A stream can be defined as a sequence of data. The StreamReader is used to read data from a source and the StreamWriter is used for writing data to a destination.

**Lab Tasks:**

1. Create a basic form in C# with the following fields: student id, age, gender, marks.
2. Add the buttons to add a new record, delete a record and update a record, in memory.
3. Create a Menu Strip from which user can save the records in a file or load the records from a file.

Code: 1 To 3

Student Class

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace WindowsFormsApplication3

{

[Serializable()]

class Student

{

public string id { get; set; }

public string name { get; set; }

public int age { get; set; }

public bool gender { get; set; }

public decimal cgpa { get; set; }

public Student(string id, string name, int age, bool gender, decimal cgpa)

{

this.id = id;

this.name = name;

this.age = age;

this.gender = gender;

this.cgpa = cgpa;

}

}

}

Form Coding:

using System;

using System.Collections.Generic;

using System.ComponentModel;

using System.Data;

using System.Drawing;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows.Forms;

using System.IO;

using System.Runtime.Serialization.Formatters.Binary;

namespace WindowsFormsApplication3

{

public partial class Form1 : Form

{

private List<Student> students = new List<Student>();

private int current = 0;

public Form1()

{

InitializeComponent();

}

private void Form1\_Load(object sender, EventArgs e)

{

students.Add(new Student("0","Subhan",20,true,3.5m));

students.Add(new Student("1", "Sehar", 18, false, 3.9m));

this.refresh\_form();

}

private void refresh\_form()

{

Student s;

if (students.Count == 0)

{

s = new Student("", "", 18, true, 0.0m);

}

else

{

s = students[current];

}

this.sid.Text = s.id;

this.sname.Text = s.name;

this.sage.Text = s.age.ToString();

this.scgpa.Text = s.cgpa.ToString();

this.smale.Checked = s.gender;

this.sfemale.Checked = !s.gender;

}

//next

private void button1\_Click(object sender, EventArgs e)

{

if (current == students.Count - 1)

{

return;

}

current++;

this.refresh\_form();

}

//previous

private void button2\_Click(object sender, EventArgs e)

{

if (current == 0)

{

return;

}

this.current--;

this.refresh\_form();

}

//update

private void button3\_Click(object sender, EventArgs e)

{

Student s = students[current];

s.id= this.sid.Text;

s.name = this.sname.Text;

s.gender = this.smale.Checked;

s.age = int.Parse(this.sage.Text);

s.cgpa = decimal.Parse(this.scgpa.Text);

MessageBox.Show("Record has been updated");

}

//delete

private void button4\_Click(object sender, EventArgs e)

{

if (current == students.Count - 1)

{

this.students.RemoveAt(current);

current = 0;

}

else

{

this.students.RemoveAt(current);

}

MessageBox.Show("The record has been deleted");

this.refresh\_form();

}

private void button5\_Click(object sender, EventArgs e)

{

this.students.Add(new Student("0", "", 0, true, 0.0m));

this.current = this.students.Count - 1;

this.refresh\_form();

}

private void saveToolStripMenuItem\_Click(object sender, EventArgs e)

{

if( this.saveFileDialog1.ShowDialog() == DialogResult.Cancel)

{

return ;

}

Stream fs = File.Open(saveFileDialog1.FileName,FileMode.Create);

BinaryFormatter bin = new BinaryFormatter();

bin.Serialize(fs,this.students);

fs.Close();

}

private void openToolStripMenuItem\_Click(object sender, EventArgs e)

{

openFileDialog1.Filter = "lab files (\*.lab)|\*.lab|All files(\*.\*)|\*.\*";

if (this.openFileDialog1.ShowDialog() == DialogResult.Cancel)

{

return;

}

Stream fs = File.Open(saveFileDialog1.FileName, FileMode.Open);

BinaryFormatter bin = new BinaryFormatter();

this.students =(List<Student>)bin.Deserialize(fs);

this.current = 0;

this.refresh\_form();

fs.Close();

}

private void exitToolStripMenuItem\_Click(object sender, EventArgs e)

{

this.Close();

}

private void newToolStripMenuItem\_Click(object sender, EventArgs e)

{

button5\_Click(null, null);

}

private void deleteToolStripMenuItem\_Click(object sender, EventArgs e)

{

button4\_Click(null, null);

}

private void updateToolStripMenuItem\_Click(object sender, EventArgs e)

{

button3\_Click(null, null);

}

private void Form1\_KeyDown(object sender, KeyEventArgs e)

{

if (e.KeyCode == Keys.Left && Control.ModifierKeys == Keys.Alt)

{

button1\_Click(null, null);

}

else if (e.KeyCode == Keys.Right && Control.ModifierKeys == Keys.Alt)

{

button2\_Click(null, null);

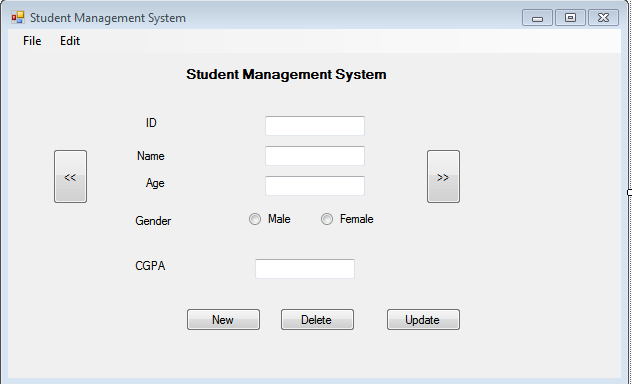
}

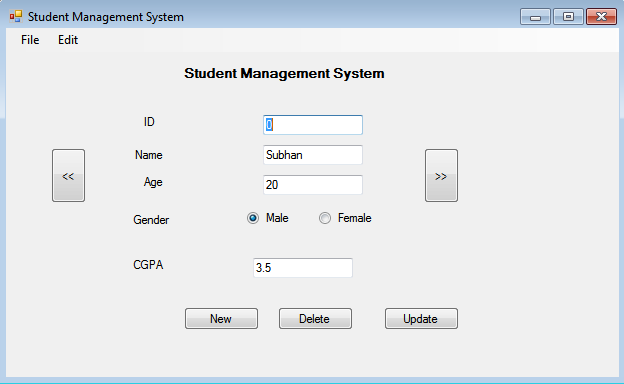
}

}

}

**Screen Shot:**





**Lab 7: To study and implement XML parsing in C#**

Extensible Markup Language (XML) defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. It is a software- and hardware-independent tool for storing and transporting data

**Lab Tasks:**

1. Create a form with a text field centered on window.
2. Create a menu strip to load XML configuration file.
3. Create an XML file to store the following information:

* Window size: The size of the current window
* Window title: The title of the window
* Background color: The background color of the window
* Foreground color: The foreground color of the window

1. You should be able to apply the settings stored in XML file to the window.

Code:

using System;

using System.Collections.Generic;

using System.ComponentModel;

using System.Data;

using System.Drawing;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows.Forms;

using System.Xml;

namespace WindowsFormsApplication4

{

public partial class Form1 : Form

{

public Form1()

{

InitializeComponent();

}

private void exitToolStripMenuItem\_Click(object sender, EventArgs e)

{

this.Close();

}

private void openToolStripMenuItem\_Click(object sender, EventArgs e)

{

if (openFileDialog1.ShowDialog() == DialogResult.OK)

{

string fname = openFileDialog1.FileName;

XmlDocument d = new XmlDocument();

d.Load(fname);

string text = d.GetElementsByTagName("text")[0].InnerText;

this.textBox1.Text = text;

string title = d.GetElementsByTagName("title")[0].InnerText;

this.Text = text;

string bcolor = d.GetElementsByTagName("background-color")[0].InnerText;

this.BackColor = Color.FromName(bcolor);

string fcolor = d.GetElementsByTagName("foreground-color")[0].InnerText;

this.label1.ForeColor = Color.FromName(fcolor);

}

}

private void button1\_Click(object sender, EventArgs e)

{

this.colorDialog1.ShowDialog();

this.BackColor = this.colorDialog1.Color;

this.button1.ForeColor = this.colorDialog1.Color;

}

private void button2\_Click(object sender, EventArgs e)

{

this.colorDialog1.ShowDialog();

this.label1.ForeColor= this.colorDialog1.Color;

this.button2.ForeColor = this.colorDialog1.Color;

}

private void button3\_Click(object sender, EventArgs e)

{

this.Text = textBox2.Text;

}

private void saveToolStripMenuItem\_Click(object sender, EventArgs e)

{

if (saveFileDialog1.ShowDialog() == DialogResult.OK)

{

XmlDocument d = new XmlDocument();

XmlText text = d.CreateTextNode(this.textBox1.Text);

XmlText title = d.CreateTextNode(this.Text);

XmlText fg = d.CreateTextNode(this.BackColor.ToArgb().ToString());

XmlText bg = d.CreateTextNode(this.ForeColor.ToArgb().ToString());

XmlElement conf = d.CreateElement(string.Empty, "configuration", string.Empty);

d.AppendChild(conf);

XmlElement el = d.CreateElement(string.Empty, "text", string.Empty);

el.AppendChild(text);

conf.AppendChild(el);

el = d.CreateElement(string.Empty, "title", string.Empty);

el.AppendChild(title);

conf.AppendChild(el);

el = d.CreateElement(string.Empty, "background-color", string.Empty);

el.AppendChild(bg);

conf.AppendChild(el);

el = d.CreateElement(string.Empty, "foreground-color", string.Empty);

el.AppendChild(fg);

conf.AppendChild(el);

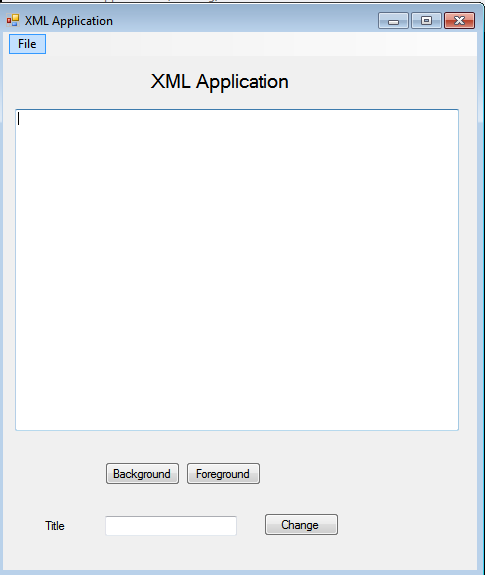
d.Save(saveFileDialog1.FileName);

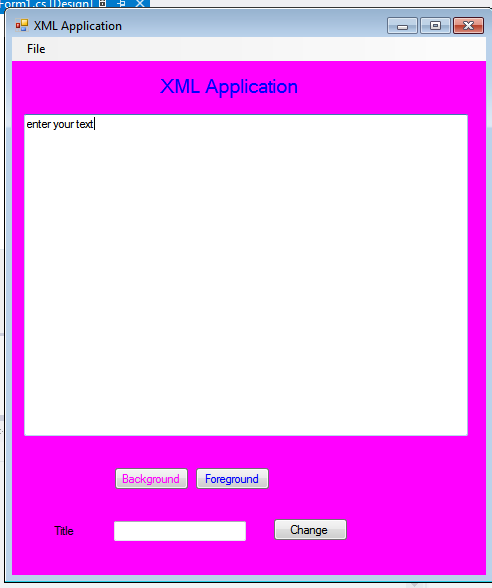
}

}

}

}





**Lab 9: To study and implement LINQ in C#**

LINQ is an extension to the C# language that integrates data query directly into the programming language itself. Visual Studio 2015 and the .NET Framework 4.5 come with a number of built-in LINQ providers that provide query solutions for different types of data

* LINQ to Objects
* LINQ to XML
* LINQ to Entities
* LINQ to Data Set

**Lab Tasks:**

1. Create an array of 1000 randomly generated numbers. Use the LINQ query to find all the odd numbers from the list. Find the count of total odd numbers. Find the maximum and minimum odd number.
2. Create a class of Student with name, subject, and marks. Now add the students in a List. Using LINQ methods and group by, find the average marks of students.
3. Create a WPF project in which you can add doctor’s details such as name, qualification and salary. The added information is saved in a List. Provide a text area through which user can write LINQ query that can be run against the list.

Code:

task 1

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication16

{

class Program

{

static void Main(string[] args)

{

int[] nums = GenerateLotsOfNumbers(100);

Console.WriteLine("Numbers");

foreach (var i in nums)

{

Console.Write(i + "");

}

Console.WriteLine("\n odd");

var result = from n in nums

where n % 2 != 0

select n;

int count = result.Count();

int max = result.Max();

int min = result.Min();

Console.WriteLine("Count {0}, Max {1}, Min {2}",count,max,min);

foreach(var i in result)

{

Console.Write(i +"");

}

Console.ReadKey();

}

private static int[] GenerateLotsOfNumbers(int count)

{

Random generator = new Random(0);

int[] result = new int[count];

for (int i = 0; i < count; i++)

{

result[i] = generator.Next();

}

return result;

}

}

}

Task 2

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication17

{

class Program

{

static void Main(string[] args)

{

List<Student> stds = new List<Student>();

stds.Add(new Student ("A", "English",57));

stds.Add(new Student("B", "English", 58));

stds.Add(new Student("C", "English", 59));

var results = stds.GroupBy(s => s.name, (key, g) => new { Student = key, Average= g.Average(s=>s.marks)});

foreach(var v in results)

{

Console.WriteLine(v);

}

Console.ReadKey();

}

}

}

student class

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ConsoleApplication17

{

class Student

{

public string name { set; get; }

public string subject { set; get; }

public int marks { set; get; }

public Student(string name, string subject, int marks)

{

this.name = name;

this.subject = subject;

this.marks = marks;

}

}

}

**Lab 10: To study and implement ADO .Net in C#**

The .NET platform defines a number of namespaces that allow you to interact with relational database systems. Collectively speaking, these namespaces are known as ADO.NET. In this lab, we will use ADO .net to connect to database.

**Lab Tasks:**

1. Create a database named School. Create a table Student.
2. Now create a windows form and show all the students records in a GridView
3. In the same windows form allow the user to add, update and delete a student record.

Code:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Navigation;

using System.Windows.Shapes;

namespace WpfApplication2

{

public partial class MainWindow : Window

{

List<Student> stds = new List<Student>();

public MainWindow()

{

InitializeComponent();

}

private void Window\_Loaded\_1(object sender, RoutedEventArgs e)

{

Student s;

stds.Add(s = new Student());

s.id = "101";

s.name = "Noman";

s.age = 20;

stds.Add(s = new Student());

s.id = "102";

s.name = "Saleem";

s.age = 21;

stds.Add(s = new Student());

s.id = "103";

s.name = "Najma";

s.age = 22;

datagrid1.ItemsSource = stds;

}

}

}

Screen Shot

