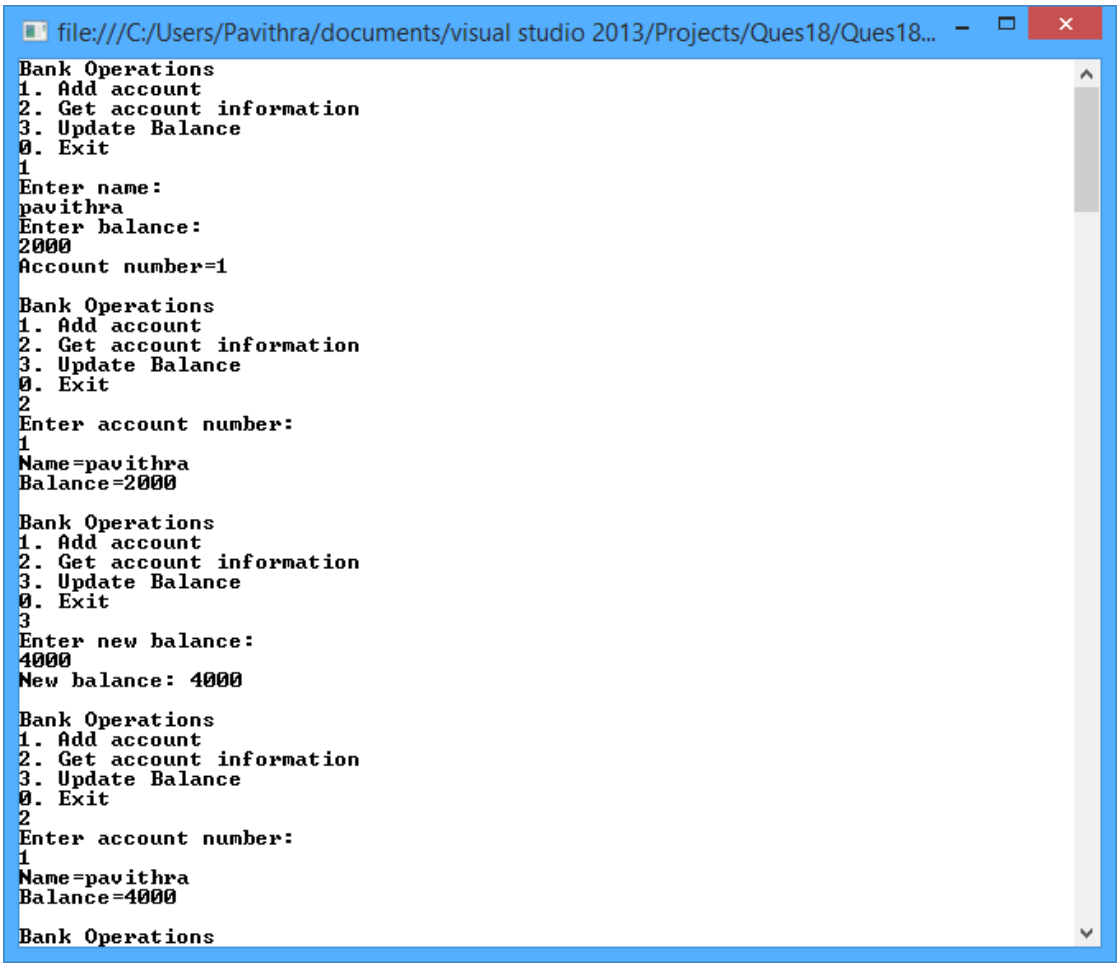
Ques 18: 18.WAP in C# in which you should create a class to represent a Bank account.

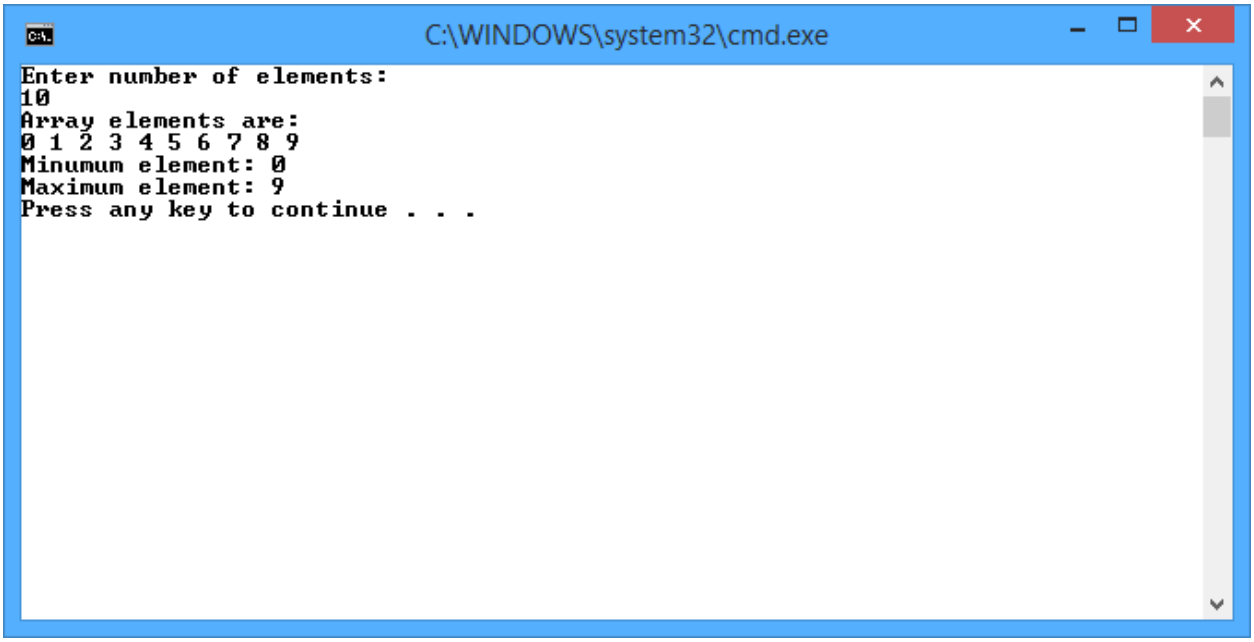
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Ques18
{
    class Bank
    {
        static int AccNo=0;
        string name;
        double balance;
        public Bank()
        {
            name = null;
            balance = 0.0;
        }
        public void setDetails()
        {
            Console.WriteLine("Enter name: ");
            name= Console.ReadLine();
            Console.WriteLine("Enter balance: ");
            balance = double.Parse(Console.ReadLine());
            AccNo = AccNo + 1;
            Console.WriteLine("Account number=" + AccNo);
        }
        public void getDetails()
        {
            Console.WriteLine("Enter account number: ");
            int accountInput = Int32.Parse(Console.ReadLine());
            Console.WriteLine("Name=" + name);
            Console.WriteLine("Balance=" + balance);

        }
        public void updateBalance()
        {
            Console.WriteLine("Enter new balance: ");
            double balanceInput = double.Parse(Console.ReadLine());
            balance = balanceInput;
            Console.WriteLine("New balance: " + balance);
        }
    }
    class Program
    {
        static void Main(string[] args)
        {
            Bank bankObj = new Bank();
            int choice;
            do
            {
                Console.WriteLine("Bank Operations");
                Console.WriteLine("1. Add account");
                Console.WriteLine("2. Get account information");
                Console.WriteLine("3. Update Balance");
                Console.WriteLine("0. Exit");
```

```
                choice = Int32.Parse(Console.ReadLine());
                switch (choice)
                {
                    case 1: bankObj.setDetails();
                        break;
                    case 2: bankObj.getDetails();
                        break;
                    case 3: bankObj.updateBalance();

                        break;
                    case 0:
                        break;
                    default:
                        break;
                }
                Console.WriteLine();
            } while (choice != 0 && choice <= 3);

        }
    }
}
```



Ques19.WAP in C# in which you should create functions in a class for Min( ) and Max( ) for finding minimum and maximum in a list.

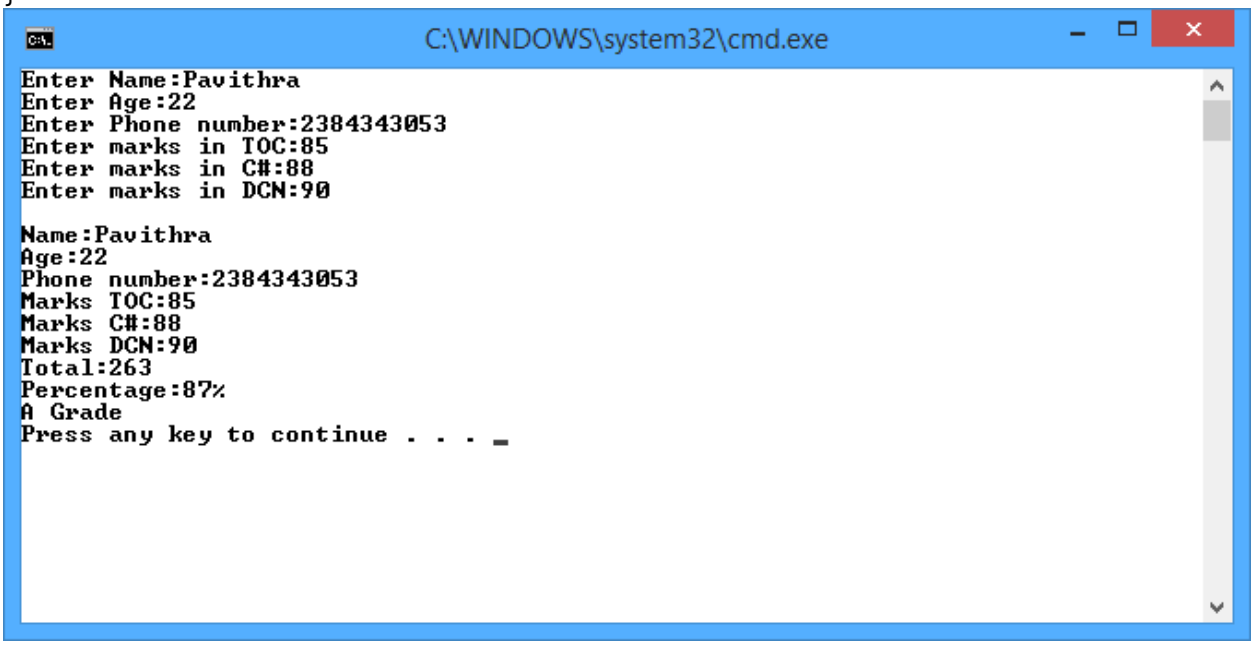
```
using System;

namespace Ques19
{
      class Program
    {
        static int min(int[ ]myArray,int count)
    {
        int minimum=myArray[0];
        for (int i = 0; i < count;i++ )
        {
            if (minimum > myArray[i])
                minimum = myArray[i];
        }

            return minimum;
    }
        static int max(int[] myArray,int count)
    {
        int maximum = myArray[0];
        for (int i = 0; i < count; i++)
        {
            if (maximum < myArray[i])
                maximum = myArray[i];
        }

        return maximum;

    }
        static void Main(string[] args)
        {
            int count;

            Console.WriteLine("Enter number of elements: ");
            count = Int32.Parse(Console.ReadLine());
            int []myArray=new int[count];
            for(int i=0;i<count;i++)
                myArray[i]=i;
            Console.WriteLine("Array elements are: ");
            for (int i = 0; i < count; i++)
                Console.Write(myArray[i] + " ");
            Console.WriteLine();
            Console.WriteLine("Minumum element: " + min(myArray, count));
            Console.WriteLine("Maximum element: " + max(myArray, count));
        }
    }
}
```


C:\WINDOWS\system32\cmd.exe
Enter number of elements:
10
Array elements are:
0 1 2 3 4 5 6 7 8 9
Minumum element: 0
Maximum element: 9
Press any key to continue . . .

Ques 20: WAP in C# to illustrate multi-level inheritance.

```
using System;
public class Student
{
    public String name;
    public int age;
    public long phone1;
    public int sub1, sub2, sub3;

    public void getdetails()
    {
        Console.Write("Enter Name:");
        name = Console.ReadLine();
        Console.Write("Enter Age:");
        age = Int32.Parse(Console.ReadLine());
        Console.Write("Enter Phone number:");
        phone1 = long.Parse(Console.ReadLine());

    }

    public void getmarks()
    {
        Console.Write("Enter marks in TOC:");
        sub1 = Int32.Parse(Console.ReadLine());
        Console.Write("Enter marks in C#:");
        sub2 = Int32.Parse(Console.ReadLine());
        Console.Write("Enter marks in DCN:");
        sub3 = Int32.Parse(Console.ReadLine());
    }
}

public class Result : Student
{
    public int total, avg;
    public void calculate()
    {
        total = sub1 + sub2 + sub3;
        avg = total / 3;
    }
    public void print_details()
    {
        Console.WriteLine("\nName:" + name);
        Console.WriteLine("Age:" + age);
        Console.WriteLine("Phone number:" + phone1);
        Console.WriteLine("Marks TOC:" + sub1);
        Console.WriteLine("Marks C#:" + sub2);
        Console.WriteLine("Marks DCN:" + sub3);
        Console.WriteLine("Total:" + total);
        Console.WriteLine("Percentage:" + avg + "%");
    }
}
public class Grade : Result
{
    public void print()
    {
        if (avg >= 85)
            Console.WriteLine("A Grade");
```

```
        else if (avg >= 75 && avg < 85)
            Console.WriteLine("B Grade");
        else if (avg >= 65 && avg < 75)
            Console.WriteLine("C Grade");
        else
            Console.WriteLine("D Grade");
    }
}
class Final
{
    public static void Main(String[] args)
    {
        Grade g = new Grade();
        g.getdetails();
        g.getmarks();
        g.calculate();
        g.print_details();
        g.print();

    }
}
```



Ques 21. Create a calculator using interoperability between C# and Visual basic.

```
Public Class Form1
    Dim input As String
    Dim operand1 As String
    Dim operand2 As String
    Dim operation As Char
    Dim result As Double
    Dim funct As New Code.Program

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button1.Click
        TextBox1.Text = " "
        input += "1"
        TextBox1.Text = input
    End Sub

    Private Sub Button2_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button2.Click
        TextBox1.Text = " "
        input += "2"
        TextBox1.Text = input
    End Sub

    Private Sub Button3_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button3.Click
        TextBox1.Text = " "
        input += "3"
        TextBox1.Text = input
    End Sub

    Private Sub Button4_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button4.Click
        TextBox1.Text = " "
        input += "4"
        TextBox1.Text = input
    End Sub

    Private Sub Button5_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button5.Click
        TextBox1.Text = " "
        input += "5"
        TextBox1.Text = input
    End Sub

    Private Sub Button6_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button6.Click
        TextBox1.Text = " "
        input += "6"
        TextBox1.Text = input
    End Sub

    Private Sub Button7_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button7.Click
        TextBox1.Text = " "
        input += "7"
        TextBox1.Text = input
    End Sub
```

```
    Private Sub Button8_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button8.Click
        TextBox1.Text = " "
        input += "8"
        TextBox1.Text = input
    End Sub

    Private Sub Button9_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button9.Click
        TextBox1.Text = " "
        input += "9"
        TextBox1.Text = input
    End Sub

    Private Sub Button10_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button10.Click
        TextBox1.Text = " "
        input += "0"
        TextBox1.Text = input
    End Sub

    Private Sub Button11_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button11.Click
        TextBox1.Text = " "
        input += "."
        TextBox1.Text = input
    End Sub

    Private Sub Button12_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button12.Click
        TextBox1.Text = " "
        input = String.Empty
        operand1 = String.Empty
        operand2 = String.Empty
        operation = String.Empty

    End Sub

    Private Sub Button13_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button13.Click
        operand1 = input
        TextBox1.Text = " "
        operation = "+"
        input = String.Empty
    End Sub

    Private Sub Button14_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button14.Click
        operand1 = input
        TextBox1.Text = " "
        operation = "-"
        input = String.Empty
    End Sub


    Private Sub Button15_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button15.Click
```

```
        operand1 = input
        TextBox1.Text = " "
        operation = "*"
        input = String.Empty
    End Sub

    Private Sub Button16_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button16.Click
        operand1 = input
        TextBox1.Text = " "
        operation = "/"
        input = String.Empty
    End Sub

    Private Sub Button17_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button17.Click
        operand2 = input
        Dim num1 As Double
        Dim num2 As Double
        num1 = operand1
        num2 = operand2

        result = funct.calculate_result(num1, num2, operation)
        TextBox1.Text = result.ToString()

    End Sub


    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load


    End Sub
End Class
```

C# Code

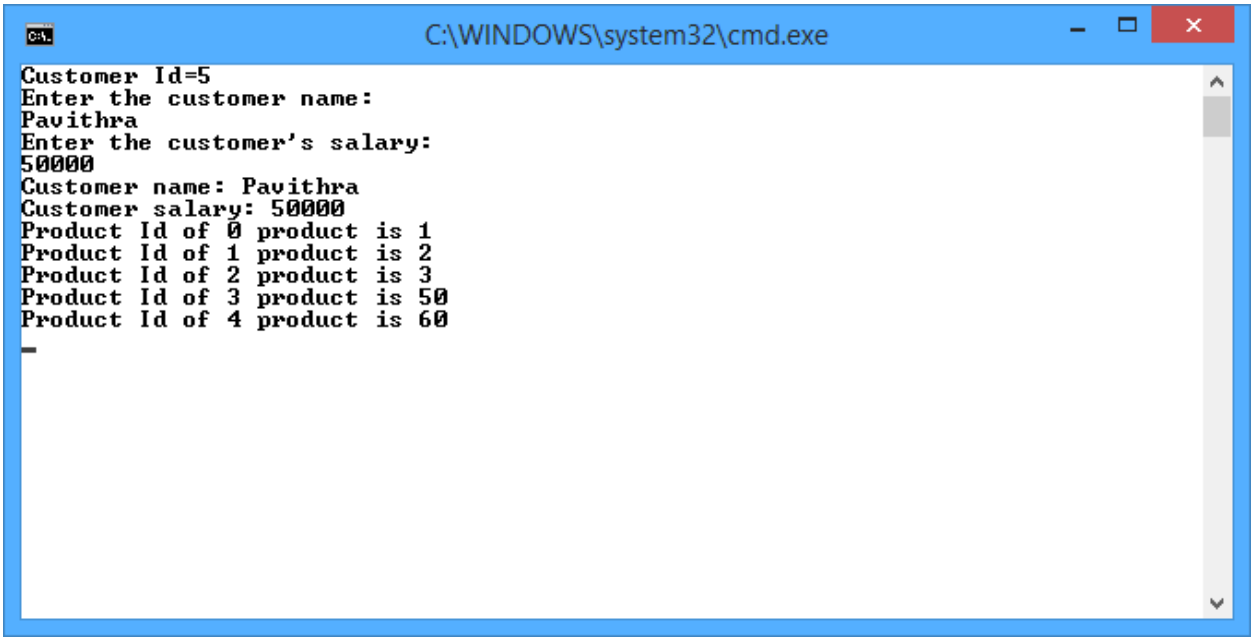
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

namespace Code
{
    public class Program
    {
        public int calculate_result(int num1, int num2, char operation)
        {
            if (operation == '+')
            {
                return num1 + num2;
            }
            else if (operation == '-')
            {
                return num1 - num2;
            }
            else if (operation == '*')
            {
```

```
            return num1 * num2;
        }
        else if (operation == '/')
        {
            if (num2 != 0)
                return num1 - num2;
            else
                return 0;
        }
        else
            return 0;
    }

    static void Main(string[] args)
    {
        Console.WriteLine("Hello");
} }}
```

Ques 22.Create a C# problem for customer management for a company using the concept of properties and indexers (take assumptions as required).

```
/* Create a C# problem for customer management for a company using the concept of
properties and indexers (take assumptions as required). */

using System;

class CustomerDetails
{
    string customerName;
    int customerID;     //by properties
    int customerSalary;
    private int[] prod_id = new int[5] {1,2,3,4,5};//array of products name bought by
customer (indexers)


    void getDetails()
    {
        Console.WriteLine("Enter the customer name: ");
        customerName = Console.ReadLine();
        Console.WriteLine("Enter the customer's salary: ");
        customerSalary=Int32.Parse(Console.ReadLine());
    }
    void setDetails()
    {
        Console.WriteLine("Customer name: "+customerName);
        Console.WriteLine("Customer salary: " +customerSalary);
    }
    public int this[int index]
    {
        get
        {
            return prod_id[index];
        }

        set
        {
            prod_id[index] = value;
        }
    }
    public int Number
    {
        get
        {
            return this.customerID;
        }
        set
        {
            this.customerID = value;
        }

    }
    public static void Main(string[] args)
    {
        CustomerDetails cd = new CustomerDetails();
        cd.Number = 5;
        Console.WriteLine("Customer Id="+cd.Number);
```

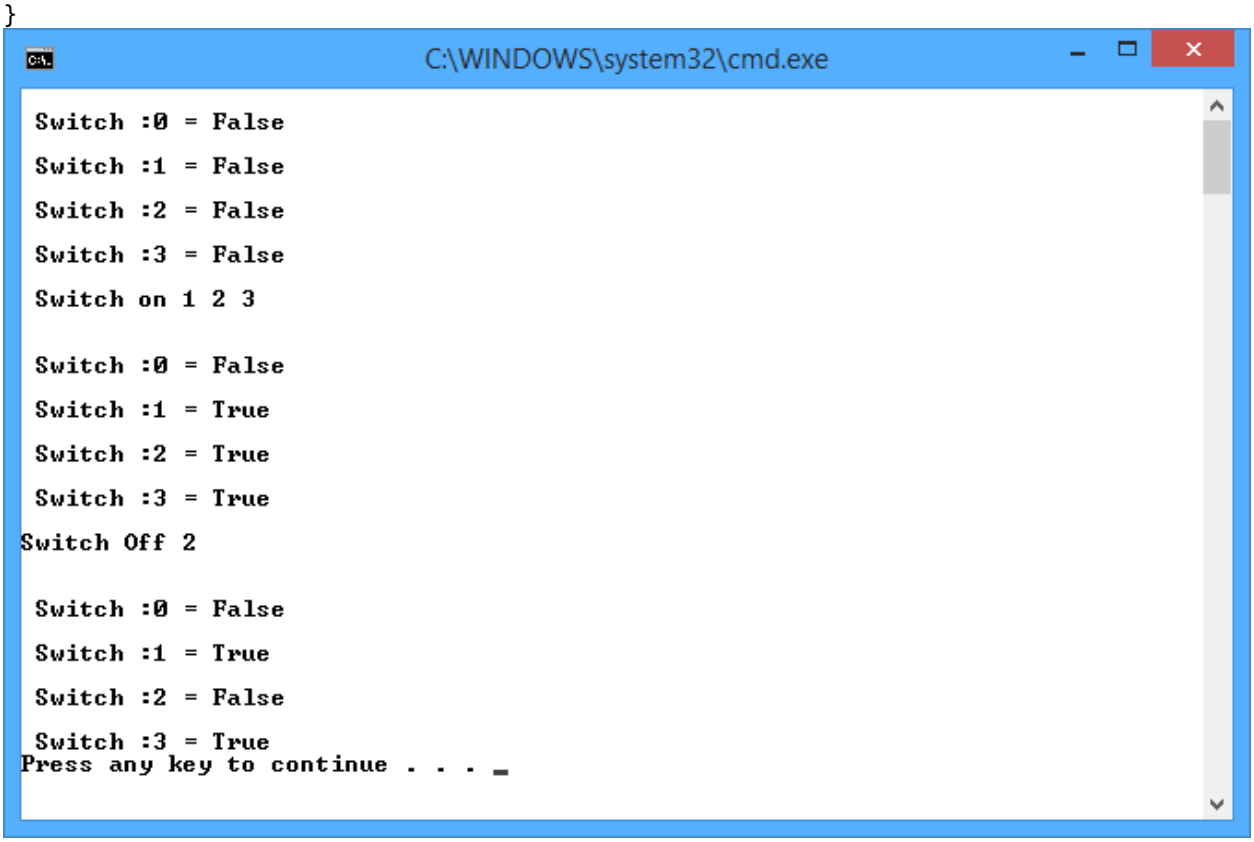
```
        cd.getDetails();
        cd.setDetails();

        // Use the indexer's set accessor
        cd[3] = 50;
        cd[4] = 60;

        // Use the indexer's get accessor
        for (int i = 0; i < 5; i++)
        {
            Console.WriteLine("Product Id of " + i + " product is " + cd[i]);
        }
        Console.ReadKey();

    }
}
```



Ques23.Develop a C# Program which shows the use a c# program which shows the use of nesting of a class with live example.

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

namespace Ques23
{
    public class Switchboard
    {

        public class Switches
        {
            Boolean[] noOfSwitches;
            int number;
            private int p;

            public Switches(int n)
            {
                number = n;
                noOfSwitches = new Boolean[n];

                for (int i = 0; i < n; i++)
                    noOfSwitches[i] = false;

            }
            public void switchOn(int n)
            {
                noOfSwitches[n] = true;
            }
            public void switchOff(int n)
            {
                noOfSwitches[n] = false;
            }
            public void switchStatus()
            {
                for (int i = 0; i < number; i++)
                    Console.WriteLine("\n Switch :" + i + " =" + " " + noOfSwitches[i]);
            }
        }


    }
    class main
    {
        static void Main(string[] args)
        {

            Switchboard.Switches ob = new Switchboard.Switches(4);

            ob.switchStatus();
            Console.WriteLine("\n Switch on 1 2 3\n");
            ob.switchOn(3);
            ob.switchOn(2);
            ob.switchOn(1);
            ob.switchStatus();
```

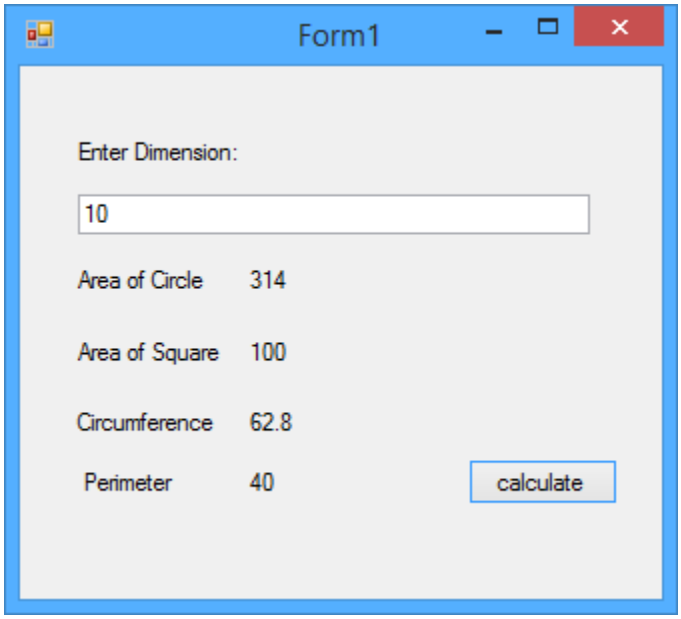
```
            Console.WriteLine("\nSwitch Off 2\n");
            ob.switchOff(2);
            ob.switchStatus();

        }
    }
}
```



Ques 24: Delegate Program based on Area using Windows Form Application.

```
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;

namespace p1
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();

        }
        public delegate void delCalc(int r);

        private void Form1_Load(object sender, EventArgs e)
        {

        }

        private void label1_Click(object sender, EventArgs e)
        {

        }

        private void label5_Click(object sender, EventArgs e)
        {

        }

        private void label4_Click(object sender, EventArgs e)
        {

        }

        private void label6_Click(object sender, EventArgs e)
        {

        }

        private void button1_Click(object sender, EventArgs e)
        {
            int r = Int32.Parse(txtBDimension.Text);
            delCalc mydelegate = calculate_Area_Circle;
            mydelegate += calculate_Area_Square;
            mydelegate += calculate_Circumference;
            mydelegate += calculate_Perimeter;
            mydelegate.Invoke(r);

        }
```

```
        private void label8_Click(object sender, EventArgs e)
        {

        }
        void calculate_Area_Circle(int r)
            {
                lblCircle.Text = (3.14 * r * r).ToString();
            }
        void calculate_Area_Square(int r)
            {
                lblSquare.Text= (r * r).ToString();
            }
        void calculate_Circumference(int r)
            {
                lblCircumference.Text= (2 * 3.14 * r).ToString();
            }
        void calculate_Perimeter(int r)
            {
                lblPerimeter.Text = (4 * r).ToString();
            }

        private void txtBDimension_TextChanged(object sender, EventArgs e)
        {

        }
    }
}
```

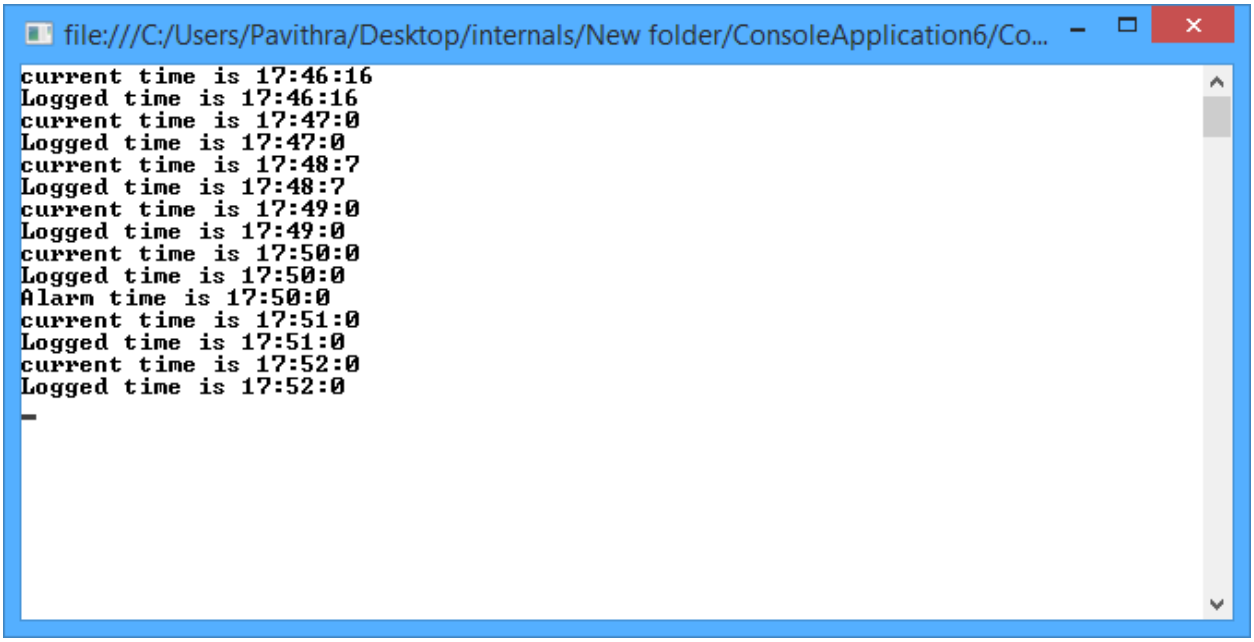


Ques 25: Delegate and even Program based on clock.

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

namespace ConsoleApplication6
{
    class TimeInfoEvent : EventArgs
    {
        public int hour;
        public int minute;
        public int second;
        public TimeInfoEvent(int h, int m, int s)
        {
            this.hour = h;
            this.minute = m;
            this.second = s;
        }
    }
    class Clock
    {
        int hour;
        int minute;
        int second;
        public delegate void MinuteChangedHandler(object sender,TimeInfoEvent T);
        public MinuteChangedHandler MinChange;
        public void Run()
        {
            for( ; ; )
            {
                DateTime dt= DateTime.Now;
                if(minute!=dt.Minute)
                {
                    TimeInfoEvent Time=new TimeInfoEvent(dt.Hour, dt.Minute, dt.Second);
                    if(MinChange!=null)
                    {
                        MinChange.Invoke(this,Time);
                    }
                }
               this.minute=dt.Minute;
                this.hour=dt.Hour;
                this.second=dt.Second;
            }
        }
    }
    class Display
    {
        public void clock_subscription(Clock obj_cl)
        {
            obj_cl.MinChange += new Clock.MinuteChangedHandler(Displ_Console);
        }
        private void Displ_Console(object sender, TimeInfoEvent T)
        {
           // if(T.second.ToString()==)
            Console.WriteLine("current time is {0}:{1}:{2}", T.hour.ToString(),
T.minute.ToString(), T.second.ToString());
```

```
        }

    }
    class WriteLog
    {
        public void clock_subscription(Clock obj_cl)
        {
            obj_cl.MinChange += new
Clock.MinuteChangedHandler(Displ_Console);//Write_Console
        }
        private void Displ_Console(object sender, TimeInfoEvent T)
        {
            Console.WriteLine("Logged time is {0}:{1}:{2}", T.hour.ToString(),
T.minute.ToString(), T.second.ToString());
        }



    }

    class Alarm
    {
        int h;
        int m;
        public int Hour
        {
            get
            {
                return this.h;
            }
            set
            {
                this.h = value;
            }
        }

        public int Minute
        {
            get
            {
                return this.m;
            }
            set
            {
                this.m = value;
            }
        }

        public void clock_subscription(Clock obj_cl)
        {
            obj_cl.MinChange += new
Clock.MinuteChangedHandler(Displ_Console);//Write_Console
        }
        private void Displ_Console(object sender, TimeInfoEvent T)
        {
            if ((this.h == T.hour) & (this.m == T.minute))
            {
```

```
                Console.WriteLine("Alarm time is {0}:{1}:{2}", T.hour.ToString(),
T.minute.ToString(), T.second.ToString());
            }
        }

    }
    class Program
    {
        static void Main(string[] args)
        {
            Clock obj_Clock=new Clock();
            Display obj_Display=new Display();
            obj_Display.clock_subscription(obj_Clock);

            WriteLog obj_WriteLog = new WriteLog();
            obj_WriteLog.clock_subscription(obj_Clock);

            Alarm myAlarm = new Alarm();
            myAlarm.Hour = 17;
            myAlarm.Minute = 50;
            myAlarm.clock_subscription(obj_Clock);
            obj_Clock.Run();
        }
    }
}
```



Ques26.Use Delegates to implement Question 13,14,15,16 and 17 in C# Windows Forms Application.

```
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;

namespace ArrayAverageSum
{
    public partial class Form1 : Form
    {
        string text;

        List<Int32> numbers = new List<Int32>();
        public delegate void delCalc(List<Int32> numbers);
        public Form1()
        {
            InitializeComponent();
        }

        private void label3_Click(object sender, EventArgs e)
        {

        }

        private void label6_Click(object sender, EventArgs e)
        {

        }

        private void label9_Click(object sender, EventArgs e)
        {

        }

        private void textBox1_TextChanged(object sender, EventArgs e)
        {
            text = textBox1.Text;

        }

        private void label1_Click(object sender, EventArgs e)
        {

        }

        private void label2_Click(object sender, EventArgs e)
        {

        }

        private void label5_Click(object sender, EventArgs e)
```

```
{

}

private void button1_Click(object sender, EventArgs e)
{
    foreach (String s in text.Split(','))
        numbers.Add(Int32.Parse(s));

    delCalc mydelegate = calculateSum;
    mydelegate += calculateAverage;
    mydelegate += calculateLargest;
    mydelegate += calculateSmallest;
    mydelegate += swap;
    mydelegate += reverseList;
    mydelegate += sortList ;



    mydelegate.Invoke(numbers);



}



private void Form1_Load(object sender, EventArgs e)
{

}

private void label2_Click_1(object sender, EventArgs e)
{

}

private void label9_Click_1(object sender, EventArgs e)
{

}

private void label4_Click(object sender, EventArgs e)
{

}

private void label8_Click(object sender, EventArgs e)
{

}

private void label6_Click_1(object sender, EventArgs e)
{

}

private void label7_Click(object sender, EventArgs e)
```

```
{

}

private void label16_Click(object sender, EventArgs e)
{

}

private void calculateAverage(List<Int32> numbers)
{
    avg_val.Text = numbers.Average().ToString();

}

private void calculateSum(List<Int32> numbers)
{
    sum_val.Text = numbers.Sum().ToString();
}

private void calculateLargest(List<Int32> numbers)
{
    largest_val.Text = numbers.Max().ToString();
}

private void calculateSmallest(List<Int32> numbers)
{
    smallest_val.Text = numbers.Min().ToString();
}

private void swap(List<Int32> numbers)
{
    int count = numbers.Count();

    int temp;


    label6.Text = numbers[0].ToString();
    label8.Text = numbers[count-1].ToString();
    //Swapping

    temp = numbers[0];
    numbers[0] = numbers[count-1];
    numbers[count-1] = temp;

    label11.Text = numbers[0].ToString();
    label13.Text = numbers[count-1].ToString();

    for (int i = 0; i <= count - 1; i++)
        label19.Text += numbers[i].ToString();

}

private void reverseList(List<Int32> numbers)
{
    int count = numbers.Count();
    numbers.Reverse();
    for (int i = 0; i <= count - 1; i++)
```

```
                label21.Text += numbers[i].ToString();
        }

        private void sortList(List<Int32> numbers)
        {
            int count = numbers.Count();
            numbers.Sort();
            for (int i = 0; i <= count - 1; i++)
                label23.Text += numbers[i].ToString();
        }
        private void label15_Click(object sender, EventArgs e)
        {

        }
    }
}
```