Homework – Week 3 – Programming

Name:

Question 3.1 - Write a program that reads in the temperature of water in a container (in Centigrade) and displays a message stating whether the water is frozen, boiling or neither.

Designer file:

```
namespace Homework_3._1
{
    partial class Form1
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        #region Windows Form Designer generated code

        /// <summary>
        /// Required method for Designer support - do not modify
        /// the contents of this method with the code editor.
        /// </summary>
        private void InitializeComponent()
```

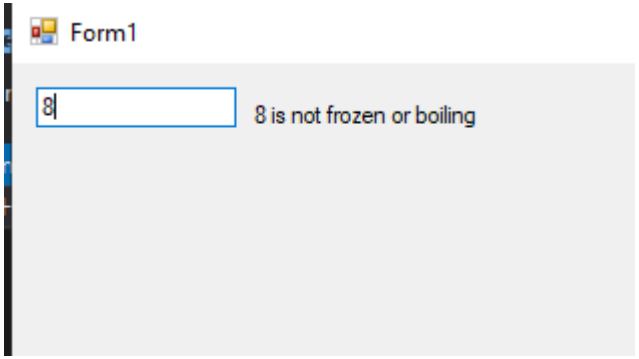
```
{
    this.TBInput = new System.Windows.Forms.TextBox();
    this.LBLOutput = new System.Windows.Forms.Label();
    this.SuspendLayout();
    //
    // TBInput
    //
    this.TBInput.Location = new System.Drawing.Point(12, 12);
    this.TBInput.Name = "TBInput";
    this.TBInput.Size = new System.Drawing.Size(100, 20);
    this.TBInput.TabIndex = 0;
    this.TBInput.TextChanged += new System.EventHandler(this.TBInput_TextChanged);
    //
    // LBLOutput
    //
    this.LBLOutput.AutoSize = true;
    this.LBLOutput.Location = new System.Drawing.Point(118, 19);
    this.LBLOutput.Name = "LBLOutput";
    this.LBLOutput.Size = new System.Drawing.Size(127, 13);
    this.LBLOutput.TabIndex = 1;
    this.LBLOutput.Text = "Enter Water Temperature";
    //
    // Form1
    //
    this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
    this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
    this.ClientSize = new System.Drawing.Size(800, 450);
    this.Controls.Add(this.LBLOutput);
    this.Controls.Add(this.TBInput);
    this.Name = "Form1";
    this.Text = "Form1";
    this.ResumeLayout(false);
    this.PerformLayout();

}

#endregion

private System.Windows.Forms.TextBox TBInput;
private System.Windows.Forms.Label LBLOutput;
```

```
    }
}
```

Code file:

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

namespace Homework_3._1
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void TBInput_TextChanged(object sender, EventArgs e)
        {
            if (Convert.ToDouble(TBInput.Text) > 100)
                {
                LBLOutput.Text = TBInput.Text + " is boiling";
                }
            else if (Convert.ToDouble(TBInput.Text) < 0)
                {
                LBLOutput.Text = TBInput.Text + " is frozen";
                }
            else
                {
                LBLOutput.Text = TBInput.Text + " is not frozen or boiling";
                }
        }
    }
}
```

Screenshot of running program:



Question 3.2 - Write a program that asks the user for the number of hours worked this week and their hourly rate of pay. The program is to calculate the gross pay. If the number of hours worked is greater than 40, the extra hours are paid at 1.5 times the rate. The program should display an error message if the number of hours worked is not in the range 0 to 60

Designer file:

```
namespace Homework_3._2
{
    partial class Homework3b
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        #region Windows Form Designer generated code

        /// <summary>
        /// Required method for Designer support - do not modify
        /// the contents of this method with the code editor.
        /// </summary>
        private void InitializeComponent()
        {
            this.TBInputHours = new System.Windows.Forms.TextBox();
            this.LBLHours = new System.Windows.Forms.Label();
            this.TBInputRate = new System.Windows.Forms.TextBox();
```

```
this.LBLRate = new System.Windows.Forms.Label();
this.LBLOutput = new System.Windows.Forms.Label();
this.BTNRun = new System.Windows.Forms.Button();
this.SuspendLayout();
//
// TBInputHours
//
this.TBInputHours.Location = new System.Drawing.Point(12, 12);
this.TBInputHours.Name = "TBInputHours";
this.TBInputHours.Size = new System.Drawing.Size(100, 20);
this.TBInputHours.TabIndex = 0;
this.TBInputHours.TextChanged += new System.EventHandler(this.TBInput_TextChanged);
//
// LBLHours
//
this.LBLHours.AutoSize = true;
this.LBLHours.Location = new System.Drawing.Point(119, 18);
this.LBLHours.Name = "LBLHours";
this.LBLHours.Size = new System.Drawing.Size(104, 13);
this.LBLHours.TabIndex = 1;
this.LBLHours.Text = "Enter Hours Worked";
//
// TBInputRate
//
this.TBInputRate.Location = new System.Drawing.Point(13, 39);
this.TBInputRate.Name = "TBInputRate";
this.TBInputRate.Size = new System.Drawing.Size(100, 20);
this.TBInputRate.TabIndex = 2;
//
// LBLRate
//
this.LBLRate.AutoSize = true;
this.LBLRate.Location = new System.Drawing.Point(120, 45);
this.LBLRate.Name = "LBLRate";
this.LBLRate.Size = new System.Drawing.Size(58, 13);
this.LBLRate.TabIndex = 3;
this.LBLRate.Text = "Enter Rate";
//
// LBLOutput
//
```

```
        this.LBLOutput.AutoSize = true;
        this.LBLOutput.Location = new System.Drawing.Point(119, 73);
        this.LBLOutput.Name = "LBLOutput";
        this.LBLOutput.Size = new System.Drawing.Size(87, 13);
        this.LBLOutput.TabIndex = 4;
        this.LBLOutput.Text = "Whats your pay?";
        //
        // BTNRun
        //
        this.BTNRun.Location = new System.Drawing.Point(13, 68);
        this.BTNRun.Name = "BTNRun";
        this.BTNRun.Size = new System.Drawing.Size(75, 23);
        this.BTNRun.TabIndex = 5;
        this.BTNRun.Text = "Run";
        this.BTNRun.UseVisualStyleBackColor = true;
        this.BTNRun.Click += new System.EventHandler(this.BTNRun_Click);
        //
        // Homework3b
        //
        this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
        this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
        this.ClientSize = new System.Drawing.Size(800, 450);
        this.Controls.Add(this.BTNRun);
        this.Controls.Add(this.LBLOutput);
        this.Controls.Add(this.LBLRate);
        this.Controls.Add(this.TBInputRate);
        this.Controls.Add(this.LBLHours);
        this.Controls.Add(this.TBInputHours);
        this.Name = "Homework3b";
        this.Text = "Form1";
        this.Load += new System.EventHandler(this.Form1_Load);
        this.ResumeLayout(false);
        this.PerformLayout();

    }

    #endregion

    private System.Windows.Forms.TextBox TBInputHours;
    private System.Windows.Forms.Label LBLHours;
```

```
        private System.Windows.Forms.TextBox TBInputRate;
        private System.Windows.Forms.Label LBLRate;
        private System.Windows.Forms.Label LBLOutput;
        private System.Windows.Forms.Button BTNRun;
    }
}
```

Code file:

```
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 Homework_4._3
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
            LBOutput.MultiColumn = true;
            for (int i = 1; i < 21; i++ )
            {
                double output = Math.Round(((i) * 2.2), 2);
                LBOutput.Items.Add(output.ToString() + " Pounds");
            }
            for (int i = 1; i < 21; i++)
            {
                LBOutput.Items.Add(i.ToString() + " KG");
            }
        }

        private void listBox1_SelectedIndexChanged(object sender, EventArgs e)
        {
```

```
        }
    }
}
```

Code file

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

namespace Homework_3._2
{
    public partial class Homework3b : Form
    {
        public Homework3b()
        {
            InitializeComponent();
        }

        private void TBInput_TextChanged(object sender, EventArgs e)
        {

        }

        private void Form1_Load(object sender, EventArgs e)
        {

        }

        private void BTNRun_Click(object sender, EventArgs e)
        {
            if ((Convert.ToInt32(TBInputHours.Text) < 60) && (Convert.ToInt32(TBInputHours.Text)) > 0)
            {
                int grossPay = 0;
                if (Convert.ToInt32(TBInputHours.Text) > 40)
                {
```

```
                    grossPay += (Convert.ToInt32(TBInputHours.Text) - 40) * Convert.ToInt32(TBInputRate.Text);
                    grossPay += 40 * Convert.ToInt32(TBInputRate.Text);
                    LBLOutput.Text = grossPay.ToString();
                }
                else
                {
                    grossPay += Convert.ToInt32(TBInputHours.Text) * Convert.ToInt32(TBInputRate.Text);
                    LBLOutput.Text = grossPay.ToString();
                }
            }
            else
            {
                LBLOutput.Text = "input hours is outside of specified values.";
            }
        }
    }
}
```

Screenshot of running program:

Question 3.3 - Write a program that reads in an exam mark and display the relevant grade. The grade boundaries are:

0 to 40 marks	grade U
41 to 50 marks	grade E
51 to 60 marks	grade D
61 to 70 marks	grade C
71 to 80 marks	grade B
81 to 100 marks	grade A

Designer file:

```
namespace Homework_3._3
{
    partial class Homework3c
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        #region Windows Form Designer generated code

        /// <summary>
        /// Required method for Designer support - do not modify
```

```
/// the contents of this method with the code editor.
/// </summary>
private void InitializeComponent()
{
    this.BTNRun = new System.Windows.Forms.Button();
    this.TBInput = new System.Windows.Forms.TextBox();
    this.LBLOutput = new System.Windows.Forms.Label();
    this.SuspendLayout();
    //
    // BTNRun
    //
    this.BTNRun.Location = new System.Drawing.Point(13, 54);
    this.BTNRun.Name = "BTNRun";
    this.BTNRun.Size = new System.Drawing.Size(75, 23);
    this.BTNRun.TabIndex = 0;
    this.BTNRun.Text = "Run";
    this.BTNRun.UseVisualStyleBackColor = true;
    this.BTNRun.Click += new System.EventHandler(this.BTNRun_Click);
    //
    // TBInput
    //
    this.TBInput.Location = new System.Drawing.Point(13, 28);
    this.TBInput.Name = "TBInput";
    this.TBInput.Size = new System.Drawing.Size(100, 20);
    this.TBInput.TabIndex = 1;
    //
    // LBLOutput
    //
    this.LBLOutput.AutoSize = true;
    this.LBLOutput.Location = new System.Drawing.Point(12, 9);
    this.LBLOutput.Name = "LBLOutput";
    this.LBLOutput.Size = new System.Drawing.Size(39, 13);
    this.LBLOutput.TabIndex = 2;
    this.LBLOutput.Text = "Output";
    //
    // Homework3c
    //
    this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
    this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
    this.ClientSize = new System.Drawing.Size(800, 450);
```

```
            this.Controls.Add(this.LBLOutput);
            this.Controls.Add(this.TBInput);
            this.Controls.Add(this.BTNRun);
            this.Name = "Homework3c";
            this.Text = "Form1";
            this.ResumeLayout(false);
            this.PerformLayout();

        }

        #endregion

        private System.Windows.Forms.Button BTNRun;
        private System.Windows.Forms.TextBox TBInput;
        private System.Windows.Forms.Label LBLOutput;
    }
}
```

Code file:

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

namespace Homework_3._3
{
    public partial class Homework3c : Form
    {
        public Homework3c()
        {
            InitializeComponent();
        }

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

```
            int input = Convert.ToInt32(TBInput.Text);
            if (input <= 40)
                {
                LBLOutput.Text = "U";
                }
            else if (input <= 50)
                {
                LBLOutput.Text = "E";
                }
            else if (input <= 60)
            {
                LBLOutput.Text = "D";
            }
            else if (input <= 70)
            {
                LBLOutput.Text = "C";
            }
            else if (input <= 80)
            {
                LBLOutput.Text = "B";
            }
            else if (input <= 100)
            {
                LBLOutput.Text = "A";
            }
        }
    }
}
```

Screenshot of running program:

Question 3.4 - Write a program that asks the user for a month number and displays the number of days that month has. Then extend this to include leap years. A leap year is a leap year if the year divides exactly by 4, but a century is not a leap year unless it is divisible by 400. For example, the year 1996 was a leap year, the year 1900 was not, but the year 2000 was a leap year. HINT: Use the operators DIV and MOD.

Designer file:

```
namespace Homework_3._4
{
    partial class HW3D
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        #region Windows Form Designer generated code

        /// <summary>
        /// Required method for Designer support - do not modify
        /// the contents of this method with the code editor.
        /// </summary>
        private void InitializeComponent()
        {
            this.BTNRun = new System.Windows.Forms.Button();
            this.LBLMonthOutput = new System.Windows.Forms.Label();
            this.LBLYearOutput = new System.Windows.Forms.Label();
```

```
this.TBYearNum = new System.Windows.Forms.TextBox();
this.TBMonthNum = new System.Windows.Forms.TextBox();
this.SuspendLayout();
//
// BTNRun
//
this.BTNRun.Location = new System.Drawing.Point(13, 68);
this.BTNRun.Name = "BTNRun";
this.BTNRun.Size = new System.Drawing.Size(75, 23);
this.BTNRun.TabIndex = 0;
this.BTNRun.Text = "Run";
this.BTNRun.UseVisualStyleBackColor = true;
this.BTNRun.Click += new System.EventHandler(this.BTNRun_Click);
//
// LBLMonthOutput
//
this.LBLMonthOutput.AutoSize = true;
this.LBLMonthOutput.Location = new System.Drawing.Point(118, 15);
this.LBLMonthOutput.Name = "LBLMonthOutput";
this.LBLMonthOutput.Size = new System.Drawing.Size(76, 13);
this.LBLMonthOutput.TabIndex = 1;
this.LBLMonthOutput.Text = "Days In Month";
//
// LBLYearOutput
//
this.LBLYearOutput.AutoSize = true;
this.LBLYearOutput.Location = new System.Drawing.Point(118, 41);
this.LBLYearOutput.Name = "LBLYearOutput";
this.LBLYearOutput.Size = new System.Drawing.Size(56, 13);
this.LBLYearOutput.TabIndex = 2;
this.LBLYearOutput.Text = "Leap Year";
//
// TBYearNum
//
this.TBYearNum.Location = new System.Drawing.Point(13, 38);
this.TBYearNum.Name = "TBYearNum";
this.TBYearNum.Size = new System.Drawing.Size(100, 20);
this.TBYearNum.TabIndex = 3;
//
// TBMonthNum
```

```
            //
            this.TBMonthNum.Location = new System.Drawing.Point(12, 12);
            this.TBMonthNum.Name = "TBMonthNum";
            this.TBMonthNum.Size = new System.Drawing.Size(100, 20);
            this.TBMonthNum.TabIndex = 4;
            //
            // HW3D
            //
            this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
            this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
            this.ClientSize = new System.Drawing.Size(800, 450);
            this.Controls.Add(this.TBMonthNum);
            this.Controls.Add(this.TBYearNum);
            this.Controls.Add(this.LBLYearOutput);
            this.Controls.Add(this.LBLMonthOutput);
            this.Controls.Add(this.BTNRun);
            this.Name = "HW3D";
            this.Text = "Form1";
            this.ResumeLayout(false);
            this.PerformLayout();

        }

        #endregion

        private System.Windows.Forms.Button BTNRun;
        private System.Windows.Forms.Label LBLMonthOutput;
        private System.Windows.Forms.Label LBLYearOutput;
        private System.Windows.Forms.TextBox TBYearNum;
        private System.Windows.Forms.TextBox TBMonthNum;
    }
}
```

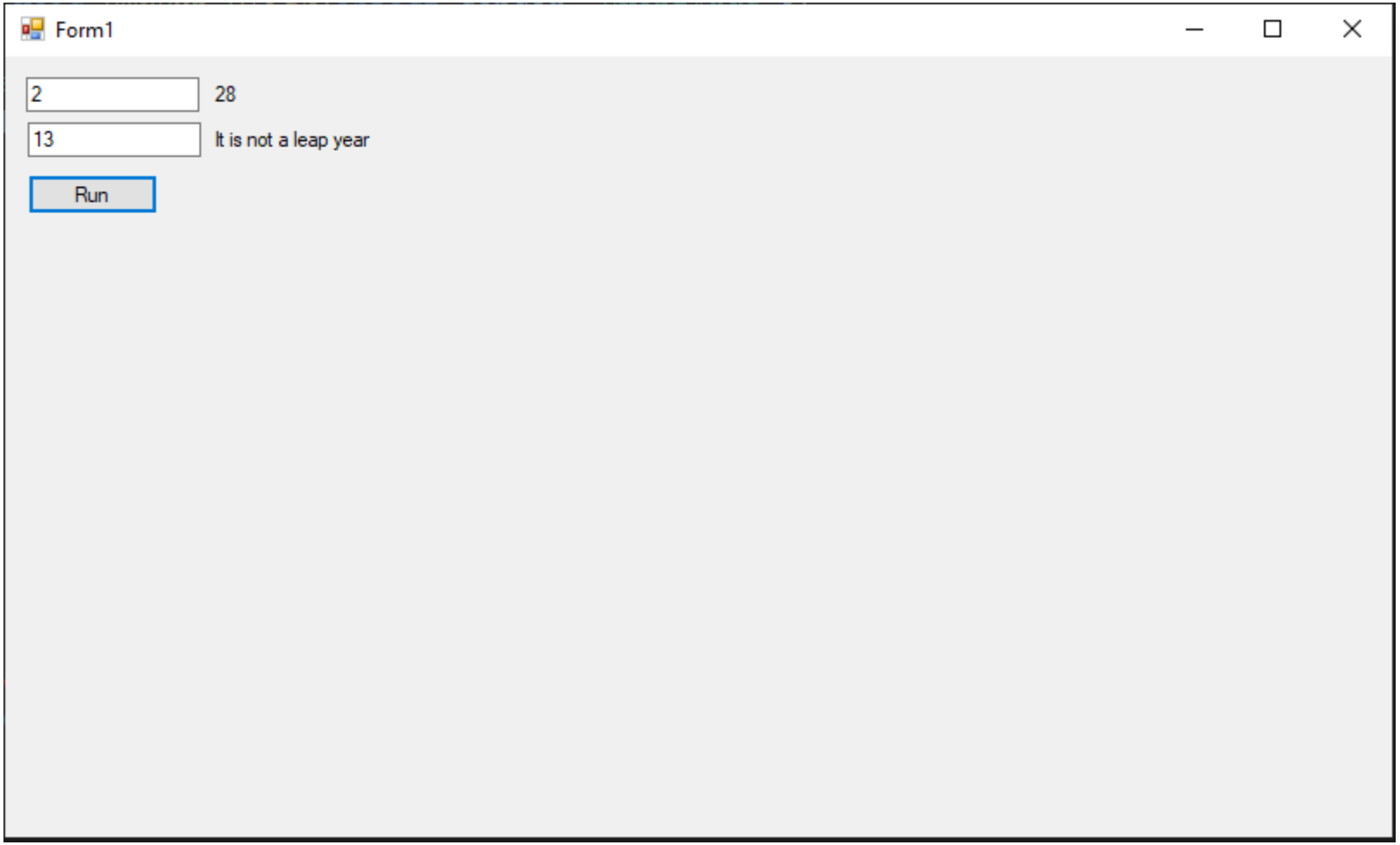
Code file:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
```

```
using System.Drawing;
using System.Text;
using System.Windows.Forms;

namespace Homework_3._4
{
    public partial class HW3D : Form
    {
        public HW3D()
        {
            InitializeComponent();
        }

        private void BTNRun_Click(object sender, EventArgs e)
        {
            const int listSize = 12;
            int[] monthList = new int[listSize];
            {
                monthList[0] = 31;
                monthList[1] = 28;
                monthList[2] = 31;
                monthList[3] = 30;
                monthList[4] = 31;
                monthList[5] = 30;
                monthList[6] = 31;
                monthList[7] = 31;
                monthList[8] = 30;
                monthList[9] = 31;
                monthList[10] = 30;
                monthList[11] = 31;
            }
            LBLMonthOutput.Text = (monthList[Convert.ToInt32(TBMonthNum.Text)-1]).ToString();
            if ((Convert.ToInt32(TBYearNum.Text) % 4) == 0)
            {
                LBLYearOutput.Text = "It is a leap year";
            }
            else
                    LBLYearOutput.Text = "It is not a leap year";

        }
```

```
    }
}
```

Screenshot of running program:



Question 3.5 - Write a program that accepts a date as three separate integers such as 12 5 03. The program should display the date in the form 12th May 2003.

Designer file:

```
namespace Homework_3._5
{
    partial class Form1
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        #region Windows Form Designer generated code

        /// <summary>
        /// Required method for Designer support - do not modify
        /// the contents of this method with the code editor.
        /// </summary>
        private void InitializeComponent()
        {
            this.TBDay = new System.Windows.Forms.TextBox();
            this.TBYear = new System.Windows.Forms.TextBox();
            this.TBMonth = new System.Windows.Forms.TextBox();
            this.BTNRun = new System.Windows.Forms.Button();
```

```
this.LBLOutput = new System.Windows.Forms.Label();
this.SuspendLayout();
//
// TBDay
//
this.TBDay.Location = new System.Drawing.Point(12, 12);
this.TBDay.Name = "TBDay";
this.TBDay.Size = new System.Drawing.Size(100, 20);
this.TBDay.TabIndex = 0;
//
// TBYear
//
this.TBYear.Location = new System.Drawing.Point(12, 64);
this.TBYear.Name = "TBYear";
this.TBYear.Size = new System.Drawing.Size(100, 20);
this.TBYear.TabIndex = 1;
//
// TBMonth
//
this.TBMonth.Location = new System.Drawing.Point(12, 38);
this.TBMonth.Name = "TBMonth";
this.TBMonth.Size = new System.Drawing.Size(100, 20);
this.TBMonth.TabIndex = 2;
//
// BTNRun
//
this.BTNRun.Location = new System.Drawing.Point(13, 91);
this.BTNRun.Name = "BTNRun";
this.BTNRun.Size = new System.Drawing.Size(75, 23);
this.BTNRun.TabIndex = 3;
this.BTNRun.Text = "Run";
this.BTNRun.UseVisualStyleBackColor = true;
this.BTNRun.Click += new System.EventHandler(this.BTNRun_Click);
//
// LBLOutput
//
this.LBLOutput.AutoSize = true;
this.LBLOutput.Location = new System.Drawing.Point(119, 13);
this.LBLOutput.Name = "LBLOutput";
this.LBLOutput.Size = new System.Drawing.Size(63, 13);
```

```
            this.LBLOutput.TabIndex = 4;
            this.LBLOutput.Text = "The Date Is";
            //
            // Form1
            //
            this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
            this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
            this.ClientSize = new System.Drawing.Size(800, 450);
            this.Controls.Add(this.LBLOutput);
            this.Controls.Add(this.BTNRun);
            this.Controls.Add(this.TBMonth);
            this.Controls.Add(this.TBYear);
            this.Controls.Add(this.TBDay);
            this.Name = "Form1";
            this.Text = "Form1";
            this.ResumeLayout(false);
            this.PerformLayout();

        }

        #endregion

        private System.Windows.Forms.TextBox TBDay;
        private System.Windows.Forms.TextBox TBYear;
        private System.Windows.Forms.TextBox TBMonth;
        private System.Windows.Forms.Button BTNRun;
        private System.Windows.Forms.Label LBLOutput;
    }
}
```

Code file:

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

```
namespace Homework_3._5
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        public string dayAppend()
        {
            string Day = TBDay.Text;
            if (Convert.ToInt32(Day) == 1)
            {
                Day = Day + "st";
            }
            else if (Convert.ToInt32(Day) == 2)
            {
                Day = Day + "nd";
            }
            else if (Convert.ToInt32(Day) == 3)
            {
                Day = Day + "rd";
            }
            else
            {
                Day = Day + "th";
            }
            return Day;
        }

        public string monthConversion()
        {
            switch(TBMonth.Text)
            {
                case "1":
                    return ("January");
                    break;
                case "2":
```

```
                return ("February");
                break;
            default:
                return ("Not A Month Number");
                break;
        }
    }

    public string yearSubstring()
    {
        string year = (TBYear.Text).Substring(TBYear.Text.Length-2);
        return year;

    }
    private void BTNRun_Click(object sender, EventArgs e)
    {
        LBLOutput.Text = dayAppend() + " " + monthConversion() + " " + yearSubstring();

    }
}
}
```

Screenshot of running program: