Name: **Session:**
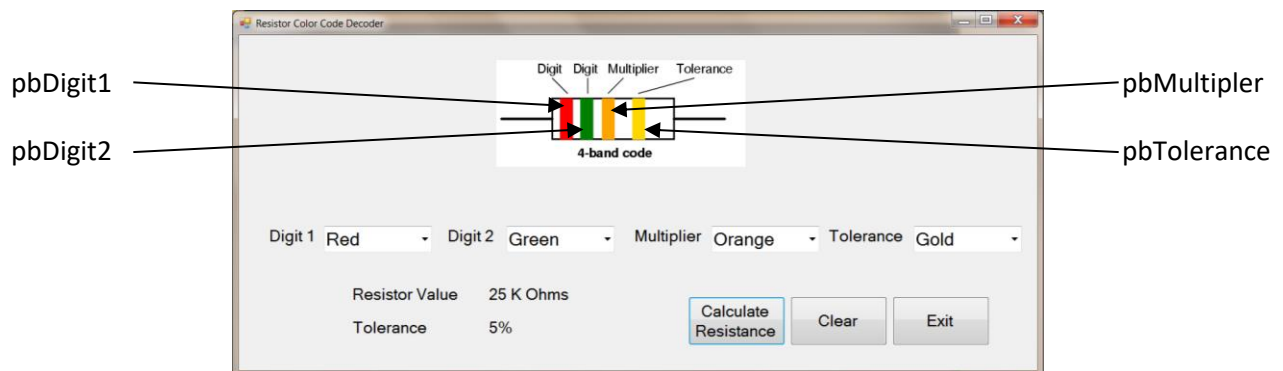**Programming II**
Lab Exercise 3.15.2023

In this exercise, you will build 3 applications. The first application is a resistor color code decoder. The second two are Zodiac sign calculator based on the user's birthday. The first Zodiac display program will get the user's birthday from a text box. The second Zodiac display program will get the user's birthday from a monthlyCalendar control.

When you complete these applications, submit a screen shot of each running application.

On the server, you will find started code for each of these projects.

Resistor Color Code Decoder

pbDigit1

pbDigit2

pbMultipler

pbTolerance

Note: the resistor picture has 4 Picture Boxes (pbDigit1, pbDigit2, pbMultiplier, and pbTolerance)

1. Open the project
2. Create the following global variables
    int digit1, digit2, tolerance;
    double multiplier;

3. Add the following code to the cboDigit1_SelectedIndexChanged event handler

```
digit1 = cboDigit1.SelectedIndex;
switch (cboDigit1.SelectedIndex)
{
   case 0:
      pbDigit1.BackColor = Color.Black;
      break;
   case 1:
      pbDigit1.BackColor = Color.Brown;
      break;
   case 2:
      pbDigit1.BackColor = Color.Red;
      break;
   case 3:
      pbDigit1.BackColor = Color.Orange;
      break;
   case 4:
      pbDigit1.BackColor = Color.Yellow;
      break;
   case 5:
      pbDigit1.BackColor = Color.Green;
      break;
   case 6:
      pbDigit1.BackColor = Color.Blue;
      break;
   case 7:
      pbDigit1.BackColor = Color.Violet;
      break;
   case 8:
      pbDigit1.BackColor = Color.Gray;
      break;
   case 9:
      pbDigit1.BackColor = Color.White;
      break;
}
```

4. Repeat step 3 for the cboDigit2_SelectedIndexChanged event handler. Be sure to change the PictureBox reference and variable and ComboBox names.

5. Add the following code to the cboMultiplier_SelectedIndexChanged event handler.

```
multiplier = Math.Pow(10, cboMultiplier.SelectedIndex);
switch (cboMultiplier.SelectedIndex)
{
  case 0:
    pbMultiplier.BackColor = Color.Black;
    break;
  case 1:
    pbMultiplier.BackColor = Color.Brown;
    break;
  case 2:
    pbMultiplier.BackColor = Color.Red;
    break;
  case 3:
    pbMultiplier.BackColor = Color.Orange;
    break;
  case 4:
    pbMultiplier.BackColor = Color.Yellow;
    break;
  case 5:
    pbMultiplier.BackColor = Color.Green;
    break;
  case 6:
    pbMultiplier.BackColor = Color.Blue;
    break;
  case 7:
    pbMultiplier.BackColor = Color.Violet;
    break;
  case 8:
    pbMultiplier.BackColor = Color.Gray;
    break;
  case 9:
    pbMultiplier.BackColor = Color.White;
    break;
  case 10:
    pbMultiplier.BackColor = Color.Gold;
    multiplier = Math.Pow(10, -1);
    break;
  case 11:
    pbMultiplier.BackColor = Color.Silver;
    multiplier = Math.Pow(10, -2);
    break;
}
```

6. Add the following code to the cboTolerance_SelectedIndexChanged event handler

```
switch (cboTolerance.SelectedIndex)
{
    case 0:
        pbTolerance.BackColor = Color.Gold;
        tolerance = 5;
        break;
    case 1:
        pbTolerance.BackColor = Color.Silver;
        tolerance = 10;
        break;
    case 2:
        pbTolerance.BackColor = Color.LightGray;
        tolerance = 20;
        break;
}
```

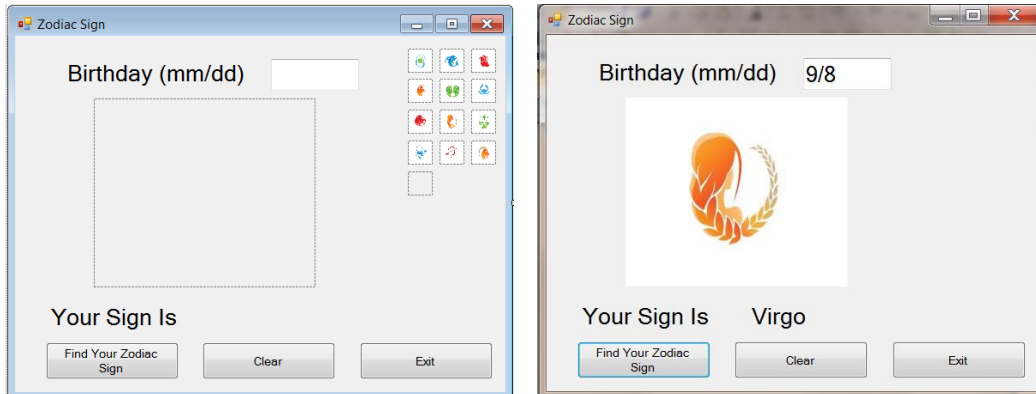7. Add the following code to the calcValue function. This function is called by the btnCalc_Click event.

```
double value;
value = (10 * digit1 + digit2) * multiplier;
if (value > 1000000000.0)
    lblValue.Text = (value / 1000000000.0).ToString() + " G Ohms";
else if (value > 1000000.0)
    lblValue.Text = (value / 1000000.0).ToString() + " M Ohms";
else if (value > 1000.0)
    lblValue.Text = (value / 1000.0).ToString() + " K Ohms";
else
    lblValue.Text = value.ToString() + " Ohms";

lblTolerance.Text = tolerance + "%";
```

8. Add the following code to the btnClear_Click event handler

```
cboDigit1.Text = "";
cboDigit2.Text = "";
cboMultiplier.Text = "";
cboTolerance.Text = "";
lblValue.Text = "";
lblTolerance.Text = "";
pbDigit1.BackColor = Color.LightGray;
pbDigit2.BackColor = Color.LightGray;
pbMultiplier.BackColor = Color.LightGray;
pbTolerance.BackColor = Color.LightGray;
```

Zodiac I

1. Open the project
2. Add the following global variable to define dates

```
DateTime startAqarius =  new DateTime(DateTime.Now.Year, 1, 20);
DateTime endAqarius = new DateTime(DateTime.Now.Year, 2, 18);
DateTime startPisces = new DateTime(DateTime.Now.Year, 2, 19);
DateTime endPisces = new DateTime(DateTime.Now.Year, 3, 20);
DateTime startAries = new DateTime(DateTime.Now.Year, 3, 21);
DateTime endAries = new DateTime(DateTime.Now.Year, 4, 19);
DateTime startTaurus = new DateTime(DateTime.Now.Year, 4, 20);
DateTime endTaurus = new DateTime(DateTime.Now.Year, 5, 20);
DateTime startGemini = new DateTime(DateTime.Now.Year, 5, 21);
DateTime endGemini = new DateTime(DateTime.Now.Year, 6, 20);
DateTime startCancer = new DateTime(DateTime.Now.Year, 6, 21);
DateTime endCancer = new DateTime(DateTime.Now.Year, 7, 22);
DateTime startLeo = new DateTime(DateTime.Now.Year, 7, 23);
DateTime endLeo = new DateTime(DateTime.Now.Year, 8, 22);
DateTime startVirgo = new DateTime(DateTime.Now.Year, 8, 23);
DateTime endVirgo = new DateTime(DateTime.Now.Year, 9, 22);
DateTime startLibra = new DateTime(DateTime.Now.Year, 9, 23);
DateTime endLibra = new DateTime(DateTime.Now.Year, 10, 22);
DateTime startScorpio = new DateTime(DateTime.Now.Year, 10, 23);
DateTime endScorpio = new DateTime(DateTime.Now.Year, 11, 21);
DateTime startSagittarius = new DateTime(DateTime.Now.Year, 11, 23);
DateTime endSagittarius = new DateTime(DateTime.Now.Year, 12, 21);
DateTime startCapricorn = new DateTime(DateTime.Now.Year, 12, 22);
DateTime endCapricorn = new DateTime(DateTime.Now.Year+1, 1, 19);
```

3. Add the following code to the btnSign_Click event handler

```
DateTime birthday;
string[] d = txtBirthday.Text.Split('/');
DateTime temp = DateTime.Now;
int year = temp.Year;
int month = Convert.ToInt32(d[0]);
int day = Convert.ToInt32(d[1]);
birthday = new DateTime(year, month, day);
if (birthday >= startAqarius && birthday <= endAqarius)
{
    this.lblSign.Text = "Aqarius";
    pbZodiac.Image = pbAquarius.Image;
}
else if (birthday >= startPisces && birthday <= endPisces)
{
    this.lblSign.Text = "Pisces";
    pbZodiac.Image = pbPisces.Image;
}
else if (birthday >= startAries && birthday <= endAries)
{
    this.lblSign.Text = "Aries";
    pbZodiac.Image = pbAries.Image;
}
else if (birthday >= startTaurus && birthday <= endTaurus)
{
    this.lblSign.Text = "Taurus";
    pbZodiac.Image = pbTaurus.Image;
}
else if (birthday >= startGemini && birthday <= endGemini)
{
    this.lblSign.Text = "Gemini";
    pbZodiac.Image = pbGemini.Image;
}
else if (birthday >= startCancer && birthday <= endCancer)
{
    this.lblSign.Text = "Cancer";
    pbZodiac.Image = pbCancer.Image;
}
else if (birthday >= startLeo && birthday <= endLeo)
{
    this.lblSign.Text = "Leo";
    pbZodiac.Image = pbLeo.Image;
}
else if (birthday >= startVirgo && birthday <= endVirgo)
{
    this.lblSign.Text = "Virgo";
    pbZodiac.Image = pbVirgo.Image;
}
```

```
        else if (birthday >= startLibra && birthday <= endLibra)
        {
            this.lblSign.Text = "Libra";
            pbZodiac.Image = pbLibra.Image;
        }
        else if (birthday >= startScorpio && birthday <= endScorpio)
        {
            this.lblSign.Text = "Scorpio";
            pbZodiac.Image = pbScorpio.Image;
        }
        else if (birthday >= startSagittarius && birthday <= endSagittarius)
        {
            this.lblSign.Text = "Sagittarius";
            pbZodiac.Image = pbSagittarius.Image;
        }
        else
        {
            this.lblSign.Text = "Capricorn";
            pbZodiac.Image = pbCapricorn.Image;
        }
```
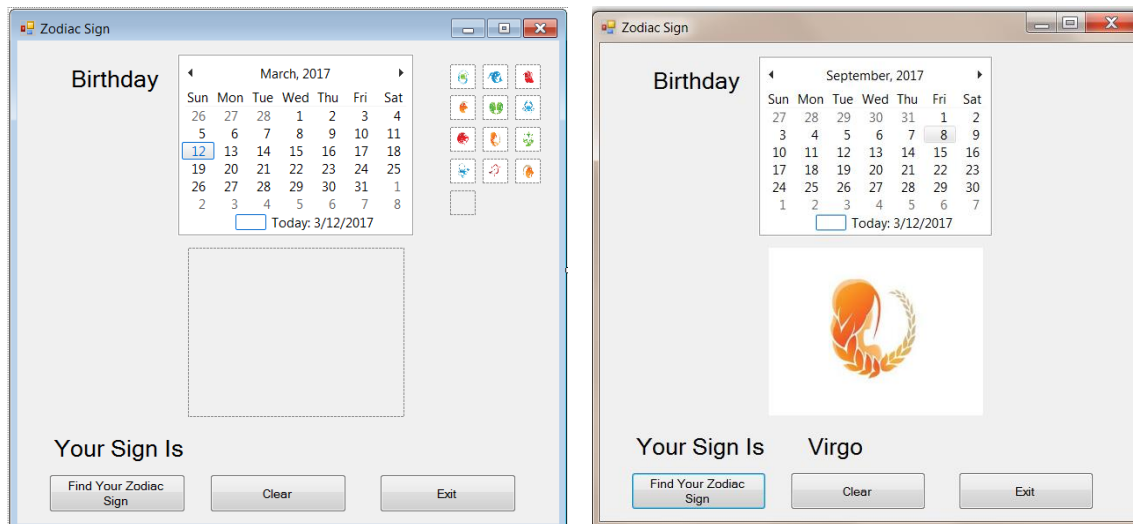
4. Add the following code to the btnClear_Click event handler

```
        lblSign.Text = "";
        txtBirthday.Text = "";
        txtBirthday.Focus();
        pbZodiac.Image = pbNull.Image;
```

Zodiac with Calendar

1. Open the project

2. Add the following global variable to define dates

```
DateTime startAqarius = new DateTime(DateTime.Now.Year, 1, 20);
DateTime endAqarius = new DateTime(DateTime.Now.Year, 2, 18);
DateTime startPisces = new DateTime(DateTime.Now.Year, 2, 19);
DateTime endPisces = new DateTime(DateTime.Now.Year, 3, 20);
DateTime startAries = new DateTime(DateTime.Now.Year, 3, 21);
DateTime endAries = new DateTime(DateTime.Now.Year, 4, 19);
DateTime startTaurus = new DateTime(DateTime.Now.Year, 4, 20);
DateTime endTaurus = new DateTime(DateTime.Now.Year, 5, 20);
DateTime startGemini = new DateTime(DateTime.Now.Year, 5, 21);
DateTime endGemini = new DateTime(DateTime.Now.Year, 6, 20);
DateTime startCancer = new DateTime(DateTime.Now.Year, 6, 21);
DateTime endCancer = new DateTime(DateTime.Now.Year, 7, 22);
DateTime startLeo = new DateTime(DateTime.Now.Year, 7, 23);
DateTime endLeo = new DateTime(DateTime.Now.Year, 8, 22);
DateTime startVirgo = new DateTime(DateTime.Now.Year, 8, 23);
DateTime endVirgo = new DateTime(DateTime.Now.Year, 9, 22);
DateTime startLibra = new DateTime(DateTime.Now.Year, 9, 23);
DateTime endLibra = new DateTime(DateTime.Now.Year, 10, 22);
DateTime startScorpio = new DateTime(DateTime.Now.Year, 10, 23);
DateTime endScorpio = new DateTime(DateTime.Now.Year, 11, 21);
DateTime startSagittarius = new DateTime(DateTime.Now.Year, 11, 23);
DateTime endSagittarius = new DateTime(DateTime.Now.Year, 12, 21);
DateTime startCapricorn = new DateTime(DateTime.Now.Year, 12, 22);
DateTime endCapricorn = new DateTime(DateTime.Now.Year+1, 1, 19);
```

3. Add the following code to the btnSign_Click event handler

```
DateTime birthday;
string[] bd = MonthCalendar1.SelectionStart.Date.ToString("dd/MM/yyyy").Split('/');
int day = Convert.ToInt32(bd[0]);
int month = Convert.ToInt32(bd[1]);
int year = Convert.ToInt32(bd[2]);
birthday = new DateTime(year, month, day);

if (birthday >= startAqarius && birthday <= endAqarius)
{
   this.lblSign.Text = "Aqarius";
   pbZodiac.Image = pbAquarius.Image;
}
else if (birthday >= startPisces && birthday <= endPisces)
{
   this.lblSign.Text = "Pisces";
   pbZodiac.Image = pbPisces.Image;
}
```

```csharp
else if (birthday >= startAries && birthday <= endAries)
{
    this.lblSign.Text = "Aries";
    pbZodiac.Image = pbAries.Image;
}
else if (birthday >= startTaurus && birthday <= endTaurus)
{
    this.lblSign.Text = "Taurus";
    pbZodiac.Image = pbTaurus.Image;
}
else if (birthday >= startGemini && birthday <= endGemini)
{
    this.lblSign.Text = "Gemini";
    pbZodiac.Image = pbGemini.Image;
}
else if (birthday >= startCancer && birthday <= endCancer)
{
    this.lblSign.Text = "Cancer";
    pbZodiac.Image = pbCancer.Image;
}
else if (birthday >= startLeo && birthday <= endLeo)
{
    this.lblSign.Text = "Leo";
    pbZodiac.Image = pbLeo.Image;
}
else if (birthday >= startVirgo && birthday <= endVirgo)
{
    this.lblSign.Text = "Virgo";
    pbZodiac.Image = pbVirgo.Image;
}
else if (birthday >= startLibra && birthday <= endLibra)
{
    this.lblSign.Text = "Libra";
    pbZodiac.Image = pbLibra.Image;
}
else if (birthday >= startScorpio && birthday <= endScorpio)
{
    this.lblSign.Text = "Scorpio";
    pbZodiac.Image = pbScorpio.Image;
}
else if (birthday >= startSagittarius && birthday <= endSagittarius)
{
    this.lblSign.Text = "Sagittarius";
    pbZodiac.Image = pbSagittarius.Image;
}
```

```
        else
        {
           this.lblSign.Text = "Capricorn";
           pbZodiac.Image = pbCapricorn.Image;
        }
```

4. Finally, add clear button code:

```
        lblSign.Text = "";
        pbZodiac.Image = pbNull.Image;
```