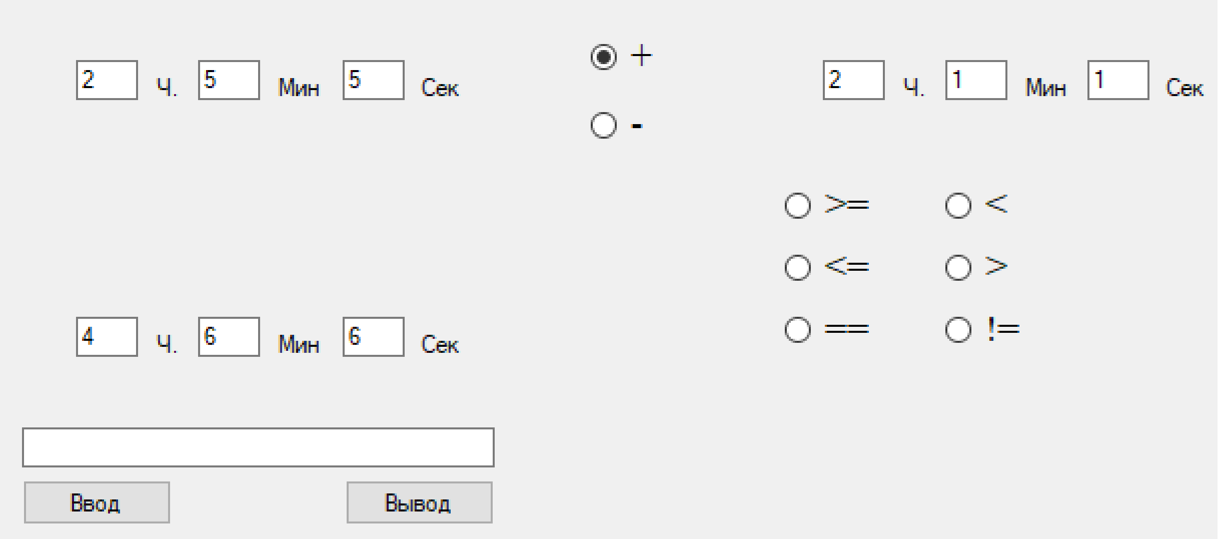
Практическая работа №12

Разработать класс «Время». Реализовать методы сложение и вычитания времени (путем переопределения стандартных операций + и -). Определить в классе конструкторы и деструктор, перегрузить операцию добавления к времени заданного количества минут, операцию вычитания двух моментов времени, операцию преобразования в символьную строку и метод получения момента времени из строки(ToString() и метод Parse(string s)).

Переопределить логические операции сравнения моментов времени (>, <, !=, ==, >=, <=).



2 ч. 5 Мин 5 Сек

● +

○ -

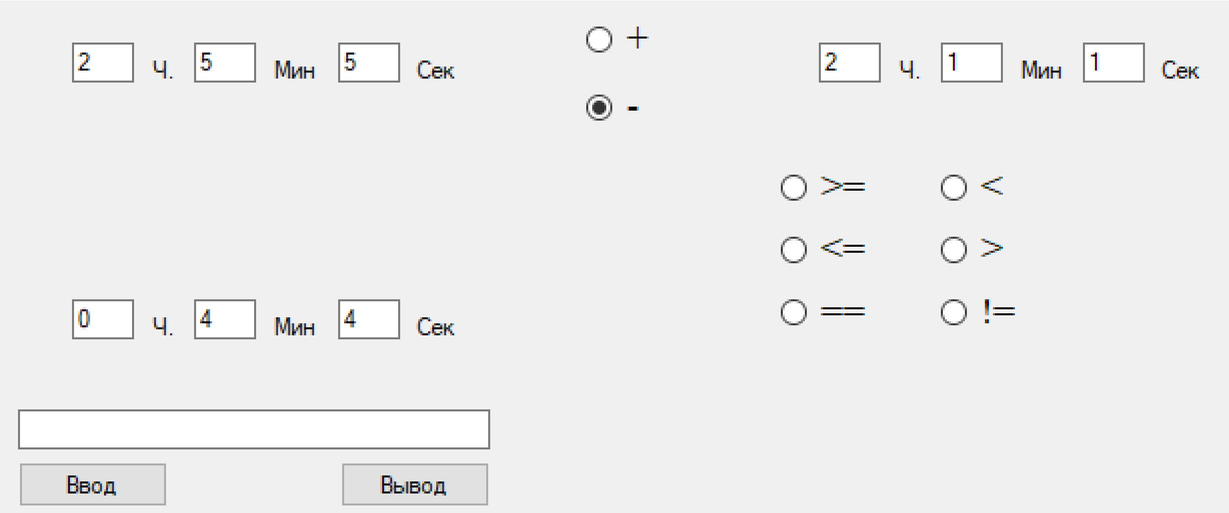
2 ч. 1 Мин 1 Сек

○ >= ○ <

○ <= ○ >

○ == ○ !=

4 ч. 6 Мин 6 Сек



2 ч. 5 Мин 5 Сек

○ +

● -

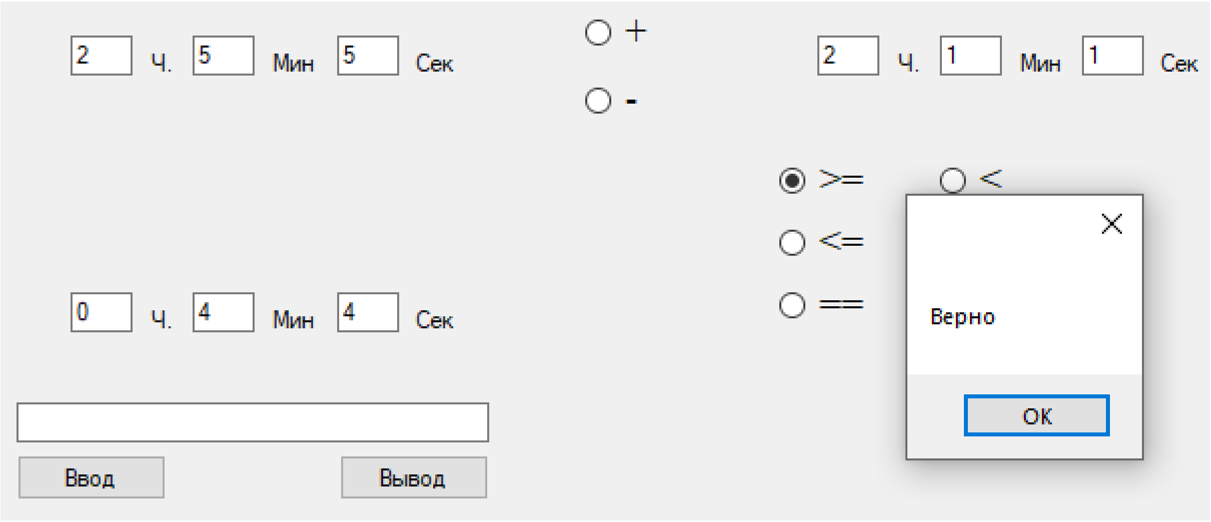
2 ч. 1 Мин 1 Сек

○ >= ○ <

○ <= ○ >

○ == ○ !=

0 ч. 4 Мин 4 Сек



2 ч. 5 Мин 5 Сек

○ +

○ -

2 ч. 1 Мин 1 Сек

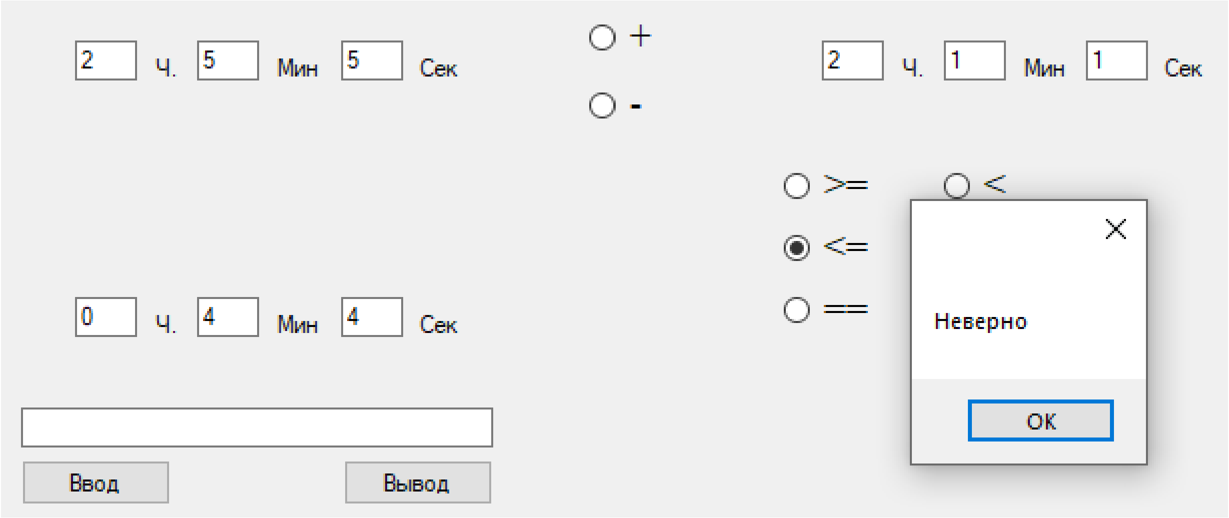
● >= ○ <

○ <=

○ ==

0 ч. 4 Мин 4 Сек

Верно



2 ч. 5 Мин 5 Сек

○ +

○ -

2 ч. 1 Мин 1 Сек

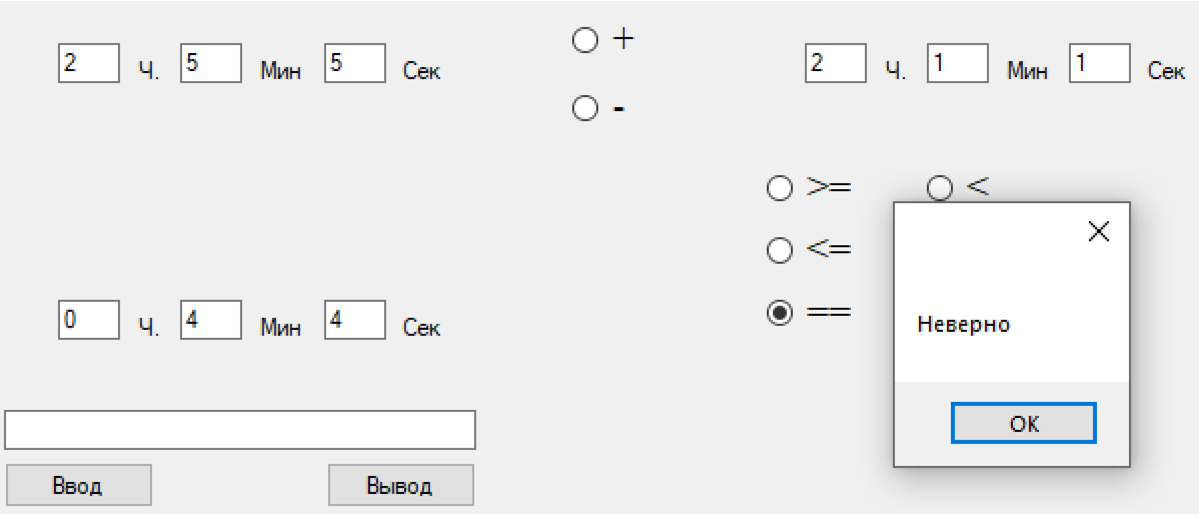
○ >= ○ <

● <=

○ ==

0 ч. 4 Мин 4 Сек

Неверно



2 ч. 5 Мин 5 Сек

○ +

○ -

2 ч. 1 Мин 1 Сек

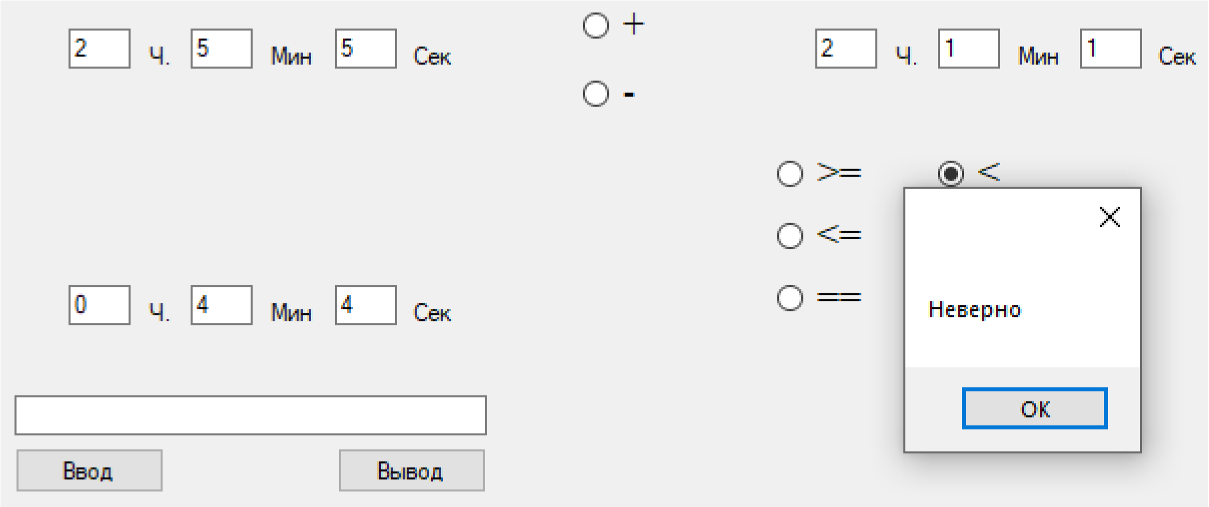
○ >= ○ <

○ <=

● ==

0 ч. 4 Мин 4 Сек

Неверно



2 ч. 5 Мин 5 Сек

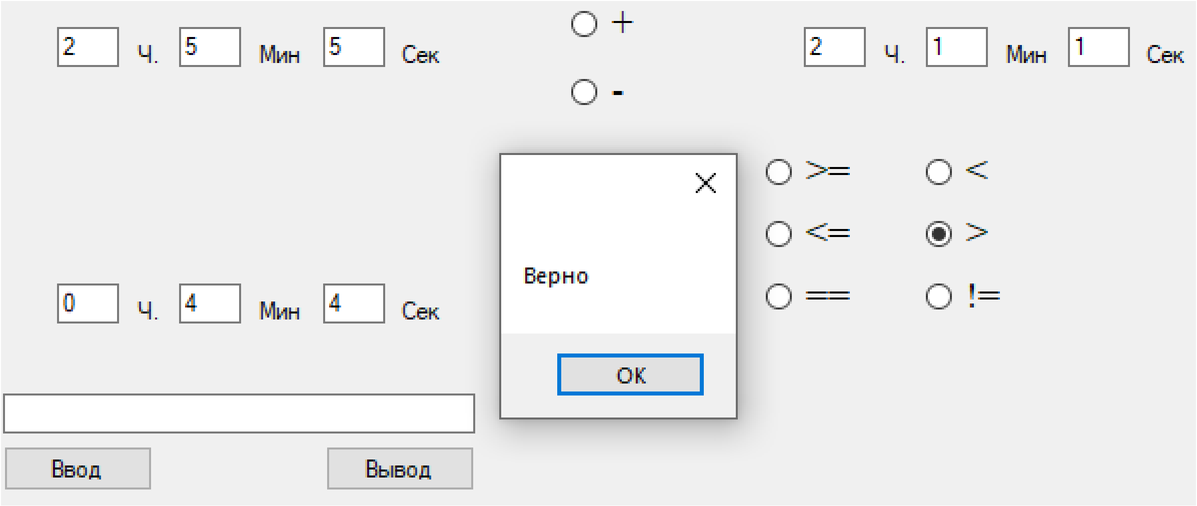
○ +
○ -

2 ч. 1 Мин 1 Сек

○ >= ● <
○ <=
○ ==

0 ч. 4 Мин 4 Сек

Неверно



2 ч. 5 Мин 5 Сек

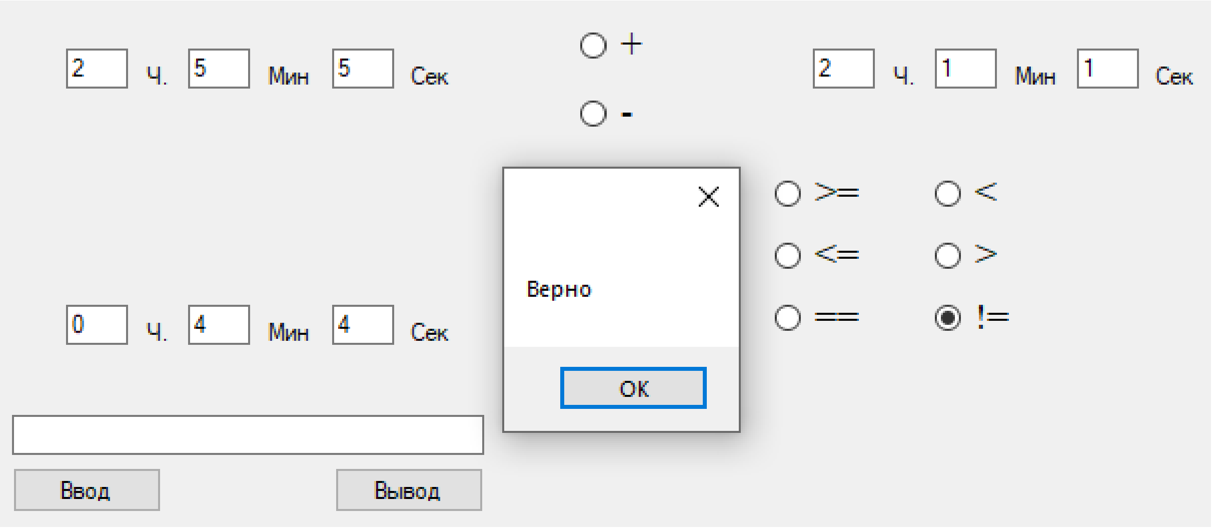
○ +
○ -

2 ч. 1 Мин 1 Сек

○ >= ○ <
○ <= ● >
○ == ○ !=

0 ч. 4 Мин 4 Сек

Верно



2 ч. 5 Мин 5 Сек

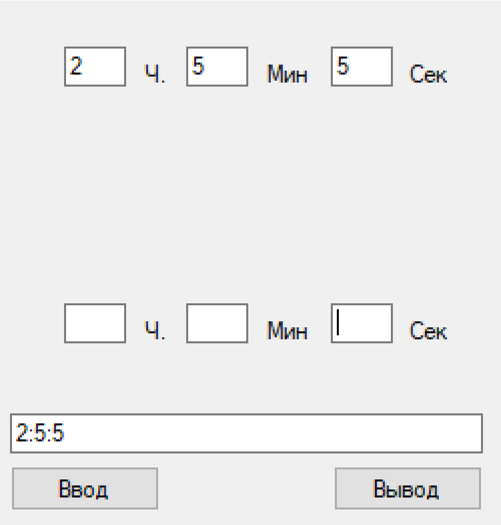
○ +
○ -

2 ч. 1 Мин 1 Сек

○ >= ○ <
○ <= ○ >
○ == ● !=

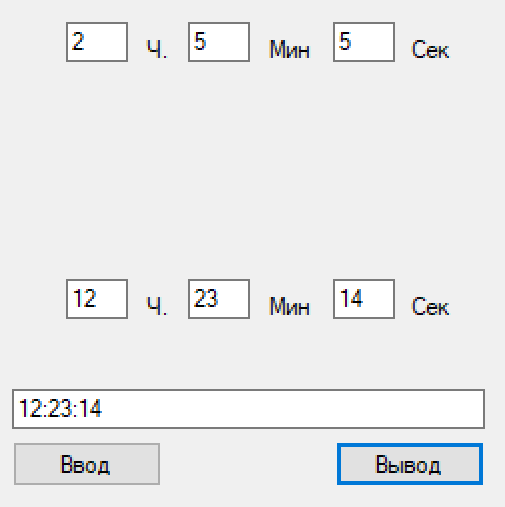
0 ч. 4 Мин 4 Сек

Верно



2 ч. 5 Мин 5 Сек

2:5:5



2 ч. 5 Мин 5 Сек

12 ч. 23 Мин 14 Сек

12:23:14

Time.cs

```
public int hour, minutes, seconds;
public Time (int n_hour,int n_minutes, int n_seconds)
{
    hour = n_hour;
    minutes = n_minutes;
    seconds = n_seconds;
}

public Time()
{
    hour = 1;
    minutes = 0;
    seconds = 0;
}

public void ToSeconds()
{
    minutes = minutes + hour * 60;
    hour = 0;
    seconds = seconds + minutes * 60;
    minutes = 0;
}
public void Addition(Time d) //Сложение времени
{
    d.ToSeconds();
    ToSeconds();
    int s = Math.Abs(d.seconds + seconds);
    minutes = s / 60;
    seconds = s % 60;
    hour = minutes / 60;
    minutes = minutes % 60;
}
public void Subtraction(Time d) //Вычитание времени
{
    d.ToSeconds();
    ToSeconds();
    int s = Math.Abs(d.seconds - seconds);
    minutes = s / 60;
    seconds = s % 60;
    hour = minutes / 60;
    minutes = minutes % 60;
}
public static Time operator +(Time b1, Time b2)
{
    Time b = new Time();
    b2.ToSeconds();
    b1.ToSeconds();
    int s = Math.Abs(b2.seconds + b1.seconds);
    b.minutes = s / 60;
    b.seconds = s % 60;
    b.hour = b.minutes / 60;
    b.minutes = b.minutes % 60;
    return b;
}
public static Time operator -(Time b1, Time b2)
{
    Time b = new Time();
    b2.ToSeconds();
    b1.ToSeconds();
    int s = Math.Abs(b2.seconds - b1.seconds);
    b.minutes = s / 60;
    b.seconds = s % 60;
    b.hour = b.minutes / 60;
    b.minutes = b.minutes % 60;
    return b;
}

public static bool operator >=(Time b1, Time b2)
{

    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 >= k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public static bool operator <=(Time b1, Time b2)
{

    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 <= k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public static bool operator <(Time b1, Time b2)
{

    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 < k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public static bool operator >(Time b1, Time b2)
{

    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 > k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public static bool operator ==(Time b1, Time b2)
{

    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 == k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public static bool operator !=(Time b1, Time b2)
{
    int k1 = b1.hour * b1.minutes * b1.seconds;
    int k2 = b2.hour * b2.minutes * b2.seconds;
    if (k1 != k2)
    {
        return true;
    }
    else
    {
        return false;
    }
}
public override string ToString()
{
    string s = "";

    if (hour != 0)
    {
```

```
                s = s + hour.ToString();
            }
            s = s + ":" + minutes + ":" + seconds;
            return s;
        }
        public static Time Parse(string str)
        {
            Time f = new Time();
            int l = str.Length;
            int n = str.IndexOf(":");
            int m = str.LastIndexOf(":");
            f.hour = Convert.ToInt32(str.Substring(0, n));
            f.minutes = Convert.ToInt32(str.Substring(n + 1, l - m - 1));
            f.seconds = Convert.ToInt32(str.Substring(m + 1, l - m - 1));



            return f;
        }
```

Form1.cs

```
        Time f, f2;
        public Form1()
        {
            InitializeComponent();
        }

        private void label5_Click(object sender, EventArgs e)
        {

        }

        private void label2_Click(object sender, EventArgs e)
        {

        }
        public void Print(Time f)
        {
            textBox9.Text = f.hour.ToString();
            textBox8.Text = f.minutes.ToString();
            textBox7.Text = f.seconds.ToString();
        }
        public Time ReceiveF()
        {
            int hour = Convert.ToInt32(textBox1.Text);
            int minutes = Convert.ToInt32(textBox2.Text);
            int seconds = Convert.ToInt32(textBox3.Text);

            Time newf= new Time(hour, minutes, seconds);
            return newf;

        }
        public Time ReceiveF2()
        {
            int hour2 = Convert.ToInt32(textBox4.Text);
            int minutes2 = Convert.ToInt32(textBox5.Text);
            int seconds2 = Convert.ToInt32(textBox6.Text);

            Time newf2= new Time(hour2, minutes2, seconds2);
            return newf2;
        }

        public void Addition(Time d)//сложение времени
        {
        }
        public void Print()
        {
            textBox9.Text = f.hour.ToString();
            textBox8.Text = f.minutes.ToString();
            textBox7.Text = f.seconds.ToString();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            ReceiveF();
            ReceiveF2();
            f.Subtraction(f2);
            Print();
        }

        private void radioButton1_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton1.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
                if (f >= f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void radioButton2_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton2.Checked)
            {
                Time f1 = ReceiveF();
                Time f2 = ReceiveF2();
                Time f3 = f1 + f2;
                Print(f3);
            }
        }

        private void radioButton3_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton3.Checked)
            {
                Time f1 = ReceiveF();
                Time f2 = ReceiveF2();
                Time f4 = f1 - f2;
                Print(f4);
            }
        }

        private void radioButton4_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton4.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
                if (f <= f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void radioButton5_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton5.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
                if (f < f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void radioButton6_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton6.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
                if (f > f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void radioButton7_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton7.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
                if (f == f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void radioButton8_CheckedChanged(object sender, EventArgs e)
        {
            if (radioButton8.Checked)
            {
                Time f = ReceiveF();
                Time f2 = ReceiveF2();
```

```
                if (f != f2)
                {
                    MessageBox.Show("Верно");
                }
                else
                {
                    MessageBox.Show("Неверно");
                }
            }
        }

        private void button1_Click_1(object sender, EventArgs e)
        {
            Time f = ReceiveF();
            textBox10.Text = f.ToString();
        }

        private void button2_Click(object sender, EventArgs e)
        {
            string s = textBox10.Text;
            Time ff = Time.Parse(s);
            Print(ff);
        }

        private void Form1_Load(object sender, EventArgs e)
        {

        }

        private void button4_Click(object sender, EventArgs e)
        {
            ReceiveF();
            ReceiveF2();
            f.Addition(f2);
            Print();
        }
```

Ссылка на гитхаб:

https://github.com/Alexandrov911/Practical-12.2022g.git