

## Proxy Pattern

### Introduction

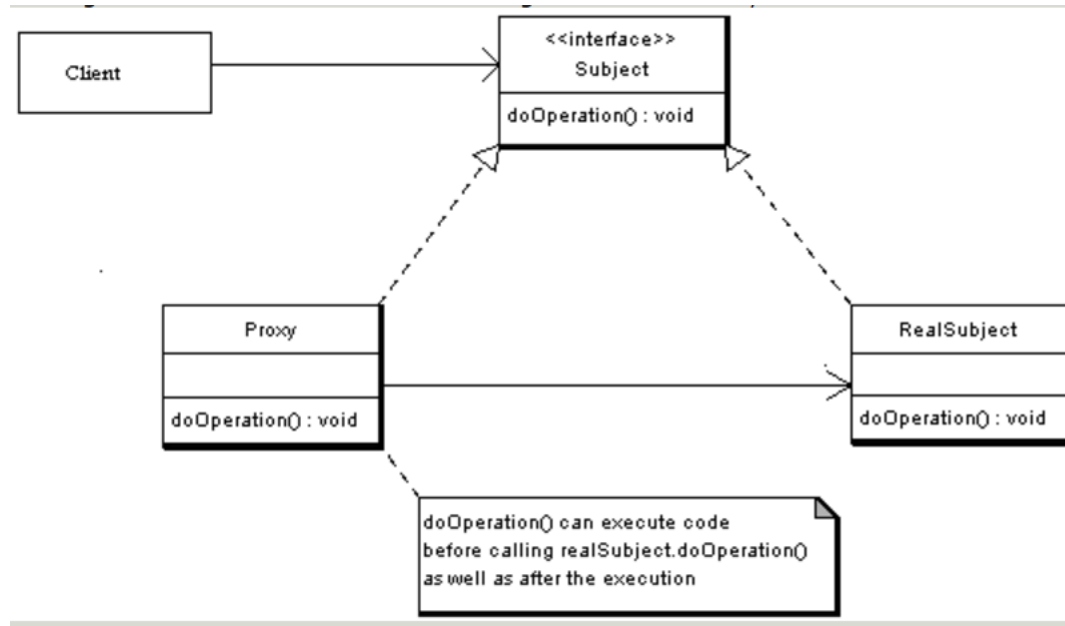
For this project, we were tasked with making a program that would demonstrate the proxy pattern. I decided to make a program that would describe cells or the components within the cell.

### Proxy UML

To the right, you will see the UML diagram that shows the Proxy pattern.

I will now show the pieces of code that make this program work.

The first piece of code is the abstract class, Subject.



```
public abstract class Subject
{
    public abstract void showComponent(string cell);
}
```

The next two pieces of code are the Proxy and RealSubject classes which implement the Subject class.

```
public class Proxy : Subject
{
    RealSubject rs = new RealSubject();

    public override void showComponent(string cell)
    {
        rs.showComponent(cell);
    }
}

public class RealSubject : Subject
{
    public override void showComponent(string cell)
    {
        if (cell=="White Blood Cell")
```

## Proxy Pattern

```
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "White blood cells (WBCs), also called
leukocytes or leucocytes, are the cells of the immune system that are involved in
protecting the body against both infectious disease and foreign invaders. All
white blood cells are produced and derived from multipotent cells in the bone
marrow known as hematopoietic stem cells. Leukocytes are found throughout the
body, including the blood and lymphatic system.";
    f2.Show();
}
else if (cell == "Red Blood Cell")
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "Red blood cells (RBCs), also called
erythrocytes, are the most common type of blood cell and the vertebrate organism's
principal means of delivering oxygen (O2) to the body tissues—via blood flow
through the circulatory system. RBCs take up oxygen in the lungs or gills and
release it into tissues while squeezing through the body's capillaries.";
    f2.Show();
}
else if (cell == "Mitochondria")
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "Mitochondria is the POWERHOUSE of the
cell.";
    f2.Show();
}
else if (cell == "Nucleus")
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "In cell biology, the nucleus (pl.
nuclei; from Latin nucleus or nuculeus, meaning kernel or seed) is a membrane-
enclosed organelle found in eukaryotic cells. Eukaryotes usually have a single
nucleus, but a few cell types, such as mammalian red blood cells, have no nuclei,
and a few others have many.";
    f2.Show();
}
else if (cell == "Rough ER")
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "The surface of the rough endoplasmic
reticulum (often abbreviated RER or Rough ER) (also called granular endoplasmic
reticulum) is studded with protein-manufacturing ribosomes giving it a rough
appearance (hence its name)";
    f2.Show();
}
else if (cell == "Smooth ER")
{
    Form2 f2 = new Form2();
    f2.m_tbDescription.Text = "The smooth endoplasmic reticulum
(abbreviated SER) has functions in several metabolic processes. It synthesizes
lipids, phospholipids, and steroids. Cells which secrete these products, such as
those in the testes, ovaries, and sebaceous glands have an abundance of smooth
endoplasmic reticulum.";
    f2.Show();
}
}
```

The last pieces of code come from Form1 and Form2 respectively.

## Proxy Pattern

```
public partial class Form1 : Form
{
    Proxy proxy;

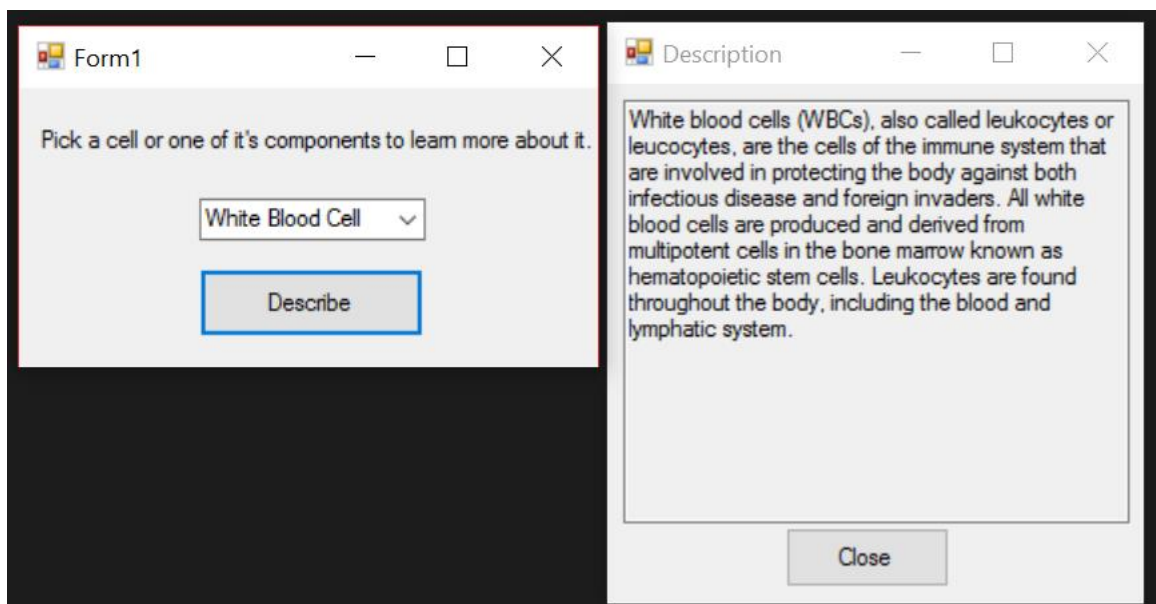
    public Form1()
    {
        InitializeComponent();
        proxy = new Proxy();
        m_cbCells.Items.Insert(0, "White Blood Cell");
        m_cbCells.Items.Insert(1, "Red Blood Cell");
        m_cbCells.Items.Insert(2, "Mitochondria");
        m_cbCells.Items.Insert(3, "Nucleus");
        m_cbCells.Items.Insert(4, "Rough ER");
        m_cbCells.Items.Insert(5, "Smooth ER");
    }

    private void button1_Click(object sender, EventArgs e)
    {
        proxy.showComponent(m_cbCells.Text);
    }
}

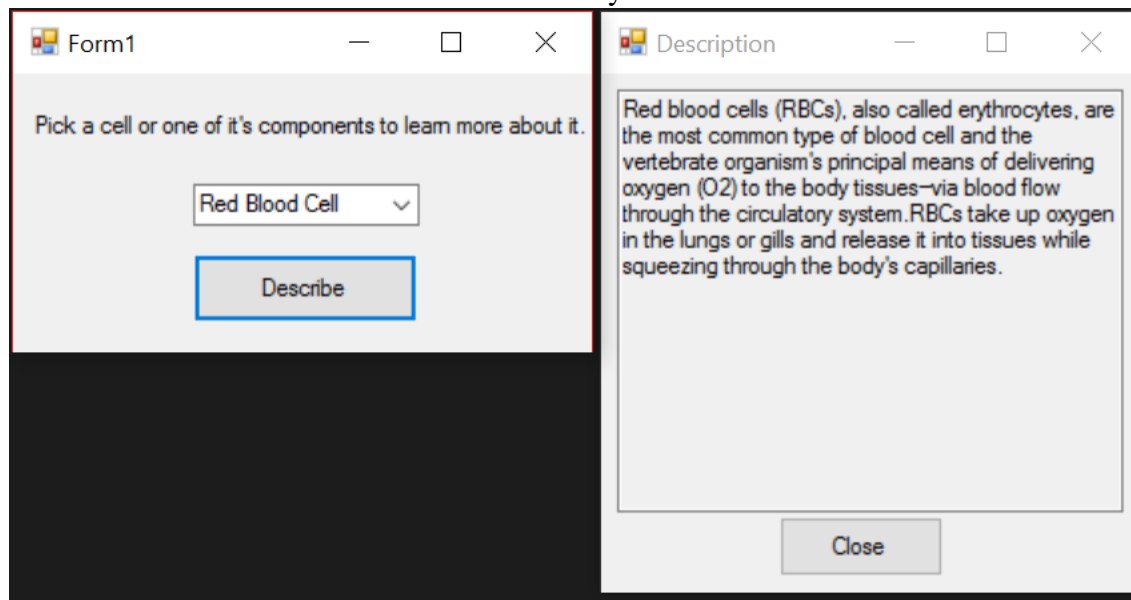
public partial class Form2 : Form
{
    public Form2()
    {
        InitializeComponent();
    }

    private void m_btnClose_Click(object sender, EventArgs e)
    {
        this.Dispose();
    }
}
```

Here are some screenshots that show my code working. First, we will start with the white and red blood cells.

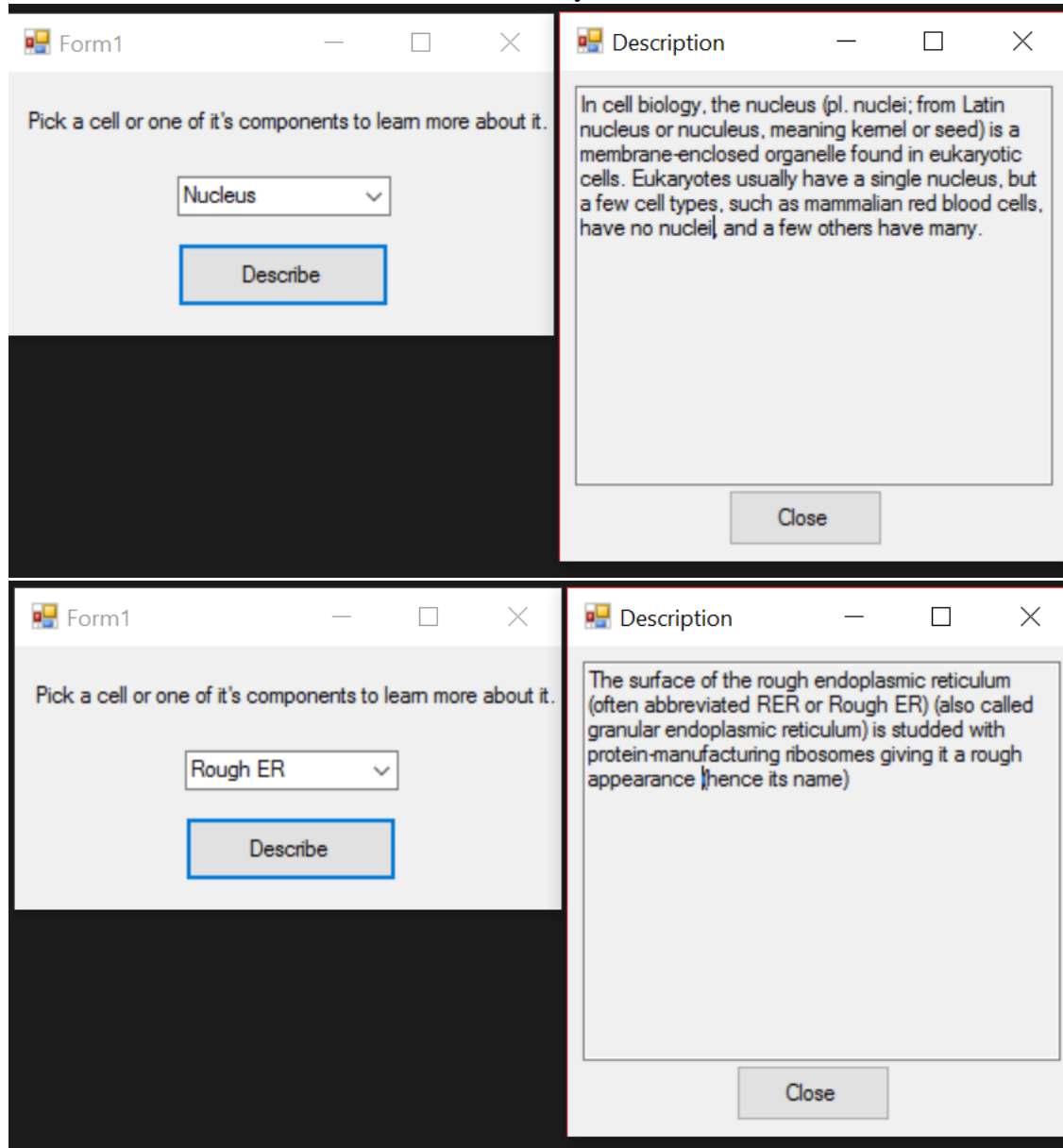


### Proxy Pattern

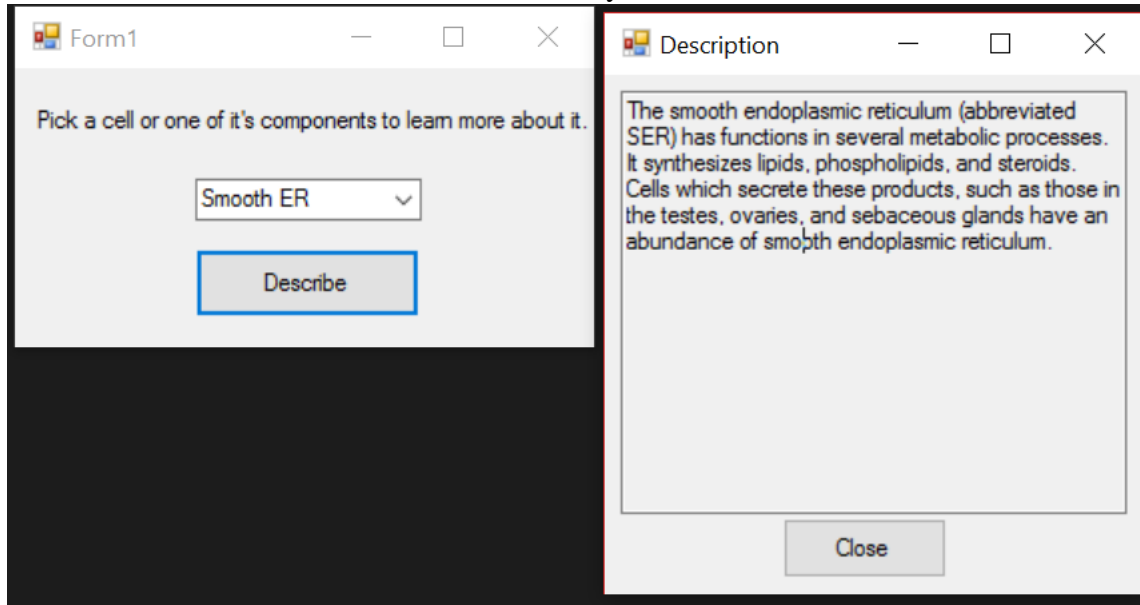


Now, we will look at the nucleus and the rough and smooth endoplasmic reticulum.

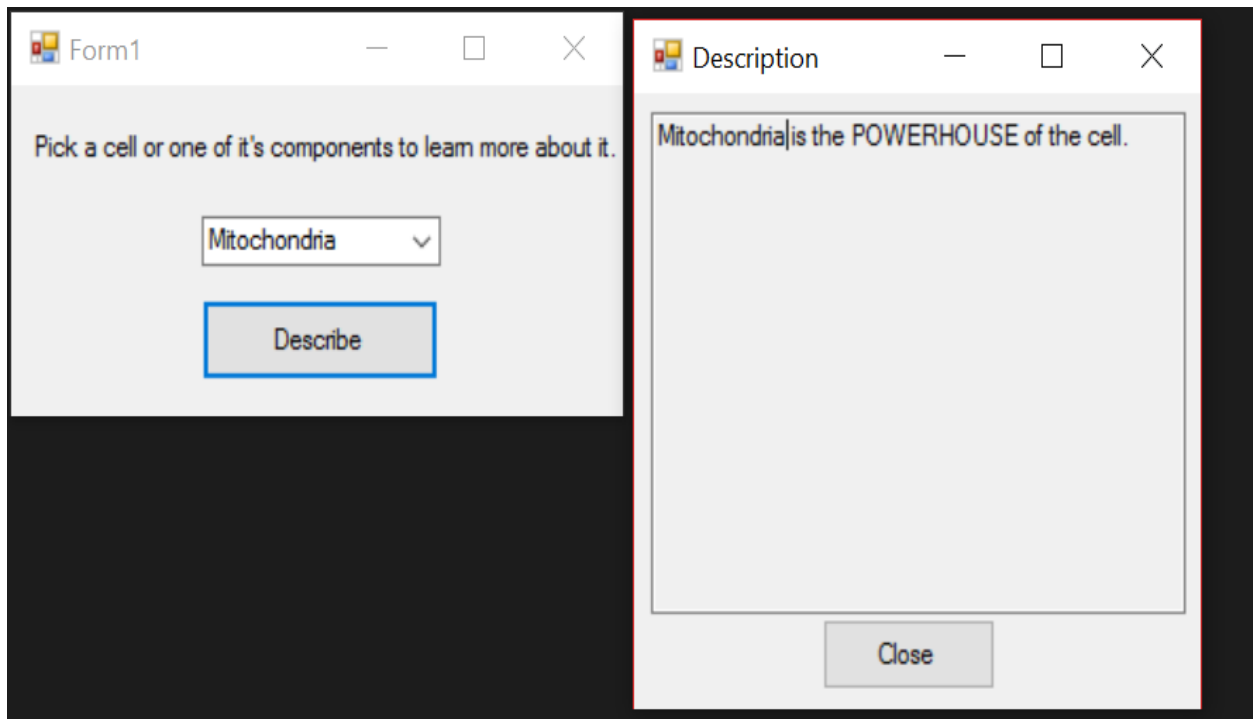
## Proxy Pattern



### Proxy Pattern



And let's not forget the most important.



## Proxy Pattern

### Conclusion

Overall, this was a pretty easy pattern to get into working condition. I would like to try to do more with the proxy pattern in the future, maybe something to do with security. I would like to try to make a program that deals with a username/password in order to get further into the program, and I think that this would be a perfect use for the Proxy pattern.