

Laboratory 2

Structural Design Pattern

Domain: Car Factory Shop

There was implemented 2 structural DPs:

- Decorator- Add responsibilities to objects dynamically
- Proxy- An object representing another object

1. Decorator- modifies the Engine property, in dependence of its Engine type (forced/echo)

```
class DecoratorEngine
{
    protected VehicleBuilder vehicleBuilder;

    public EngineType engineType;

    public DecoratorEngine(VehicleBuilder vehicleBuilder)
    {
        this.vehicleBuilder = vehicleBuilder;
    }

    public void BuildEngine(EngineType type)
    {
        engineType = type;
    }

    public VehicleBuilder Clone()
    {
        if (vehicleBuilder != null)
        {
            if (engineType.GetType().Name == "ForcedEngine")
            {
                vehicleBuilder.vehicle["engine"] = vehicleBuilder.vehicle["engine"] +
" forced";
            }
            else
            {
                if (engineType.GetType().Name == "EchoEngine")
                {
                    vehicleBuilder.vehicle["engine"] =
vehicleBuilder.vehicle["engine"] + " echo";
                }

                return vehicleBuilder;
            }
            else return null;
        }
    }
}
```

2. Proxy- The proxy class checks the customer age and if it is 18+ then the vehicle is cloned

```

class ProxyVehicle : VehicleBuilder
{
    public override void BuildFrame()
    {
    }
    public override void BuildEngine()
    {
    }
    public override void BuildWheels()
    {
    }
    public override void BuildDoors()
    {
    }
    public override VehicleBuilder Clone()
    {
        return (VehicleBuilder)this.MemberwiseClone();
    }

    public VehicleBuilder Clone(int age)
    {
        if (age > 17)
        {
            return (VehicleBuilder)this.MemberwiseClone();
        }
        else return null;
    }
}

```

```

.....
SelectedItem = Singleton.Singleton.Instance.GetVehicle(listBox1.SelectedIndex) as
ProxyVehicle;

```

```

        var newItem = SelectedItem.Clone(int.Parse(edtAge.Text));
        if (newItem != null)
        {
            string ss = newItem.Vehicle.GetModel();

            listBox2.Items.Clear();
            listBox2.Items.Add(ss);
        }
        else MessageBox.Show("You are less than 18 years old!");
    }
}

```