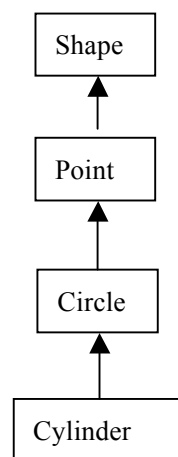


继承与多态的灵活运用

1. 解决方案Shapes里有个Shape项目，项目里有Point(点)、Line(线)、Circle（圆）、Cylinder（圆柱体）、Triangle（三角形）、Quadrilateral（四边形）、Trapaezoid（梯形）、Parallelogram（平行四边形）、Rhombus（菱形）、Rectangle(长方形)、Quadrate.cs正方形等形状。
2. 他们之间的继承关系已在程序中体现。例如，下图显示的是点-圆-圆柱体的继承关系。
3. 要求：仔细阅读程序，增加程序。并用TestMain程序来测试打印出各自的周长、面积、体积等。



增加 Cylinder.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

public class Cylinder:Circle//圆柱体
{
    private double h;
    public double H {
        get { return this.h; }
        set { this.h = value; }
    }

    public Cylinder():base(0, 0, 1) {
        base.R = 1;
    }
}
```

```

        this.h = 1;
    }

    public Cylinder(double x, double y, double r, double h):base(x, y, r) {
        base.X = x;
        base.Y = y;
        base.R = r;
        this.h = h;
    }

    public Cylinder(Circle c, double h):base(c.X, c.Y, c.R) {
        base.X = c.X;
        base.Y = c.Y;
        base.R = c.R;
        this.h = h;
    }

    // 返回圆柱的体积
    public double CylinderBulk() {
        return base.Area() * this.h;
    }

}

```

TestMain.cs

```

using System;

public class TestMain
{
    public static void Main(string[] args)
    {
        Circle circle = new Circle(37, 43, 2.5);

        Console.WriteLine("该圆的圆心的坐标是:{0},{1}", circle.X, circle.Y);
        circle.X = 20;
        circle.Y = 20;

        Console.WriteLine("该圆的新圆心坐标是:{0},{1}", circle.X, circle.Y);

        // 打印圆的周长
        Console.WriteLine("该圆的周长是:{0}", circle.CircumFERENCE());

        // 打印圆的面积
        Console.WriteLine("该圆的面积是:{0}", circle.Area());
    }
}

```

```

// 创建圆柱体的实例 1
Cylinder cylinder1 = new Cylinder(circle, 3);
Console.WriteLine("圆柱体 1 的体积是:{0}", cylinder1.CylinderBulk());

// 创建圆柱体实例 2
Cylinder cylinder2 = new Cylinder();
Console.WriteLine("圆柱体 2 的体积是:{0}", cylinder2.CylinderBulk());

// 创建圆柱体实例 3
Cylinder cylinder3 = new Cylinder(1, 1, 2, 1);
Console.WriteLine("圆柱体 3 的体积是:{0}", cylinder3.CylinderBulk());

Console.ReadLine();
}
}

```

运行结果:

► 应用程序输出 - Shape

```

Loaded assembly: /Users/a1/Documents/实验报告们/c_sharp_learning/homewo
该圆的圆心的坐标是:37,43
该圆的新圆心坐标是:20,20
该圆的周长是:15.707963267949
该圆的面积是:19.6349540849362
圆柱体1的体积是:58.9048622548086
圆柱体2的体积是:3.14159265358979
圆柱体3的体积是:12.5663706143592

```

1