

# 实验十

代码:

```
#include<iostream>
#include "Array.h"
#include<math.h>
#include<cstdlib>
#include<vector>
using namespace std;
class shape {
public:
    virtual float getCircumference() {
        return 0.1;
    }
    virtual void showInfo() {
        cout << "123" << endl;
    }
    bool operator>(shape &someshape) {
        return (this->getCircumference() < someshape.getCircumference());
    }
    bool operator<( shape &someshape) {
        return (this->getCircumference() < someshape.getCircumference());
    }
};
class Rectangle :public shape {
public:
    Rectangle() {
        cout << "请输入 Rectangle 的" << "宽和高: ";
        cin >> this->width >> this->height;
    }
    float getCircumference(){
        return 2 * (this->width + this->height);
    }
    void showInfo() {
        cout << "矩形 " << '\t' << "宽: " << this->width << '\t' << "高: " << this->height << '\t' <<
"周长:  " << this->getCircumference() << endl;
    }
private:
    int width = 0;
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        int height = 0;
};
class RightTriangle :public shape {
public:
    RightTriangle() {
        cout << "请输入 RightTriangle 的" << "两条直角边： ";
        cin >> this->width >> this->height;
    }
    float getCircumference() {
        float lenght = sqrt(pow(this->height, 2) + pow(this->width, 2));
        return lenght + this->width + this->height;
    }
    void showInfo() {
        cout << "直角三角形 " << ' ' << "直角边： " << this->width << '\t' << this->height << '\t'
        << "周长： " << this->getCircumference() << endl;
    }
private:
    int width = 0;
    int height = 0;
};
class Circle :public shape {
public:
    Circle() {
        cout << "请输入 Circle 的" << "半径： ";
        cin >> this->r;
    }
    float getCircumference() {
        return pow(this->r, 2) * 3.14;
    }
    void showInfo() {
        cout << " 圆  " << '\t' << " 半径： " << this->r << '\t' << " 周长： " <<
        this->getCircumference() << endl;
    }
private:
    int r = 0;
};
void showInfo1() {
    cout << "请选择框架： " << endl;
    cout << "1.矩形： " << endl;
    cout << "2.直角三角形" << endl;
    cout << "3.圆" << endl;
    cout << "-1.退出" << endl;
}
void insert(Array<shape*>&shapeArray,int n) {

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        for (int i = 0; i < n; i++)
        {
            int max = i;
            for (int j = i + 1; j < n; j++)
            {
                if (*shapeArray[max] < *shapeArray[j]) {
                    max = j;
                }
            }
            shape* temp = shapeArray[i];
            shapeArray[i] = shapeArray[max];
            shapeArray[max] = temp;
        }
    }
}

int main() {
    int choice = 0;
    Array<shape*>shapeArray(50);
    int n = 0;
    shape** ptr = NULL;
    ptr = new shape * [50];
    for (int i = 0; i < 50; i++)
    {
        shapeArray[i] = NULL;
    }
    while (choice!=-1)
    {
        showInfo1();
        cin >> choice;
        if (choice==-1)
        {
            break;
        }
        switch (choice)
        {
            case 1:
                shapeArray[n] = new Rectangle;
                n++;
                break;
            case 2:
                shapeArray[n] = new RightTriangle;
                n++;
                break;
            case 3:
                shapeArray[n] = new Circle;

```

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        n++;
        break;
    default:
        break;
    }
    system("pause");
    system("cls");
}
cout << n << endl;
int max = 0;
insert(shapeArray, n);
for (int i = 0; i < n; i++)
{
    if (shapeArray[i])
    {
        shapeArray[i]->showInfo();
    }
}
}

```

截图：

```

Microsoft Visual Studio 调试控制台
请选择框架：
1. 矩形：
2. 直角三角形
3. 圆
-1. 退出
-1
3
圆      半径： 5  周长： 78.5
直角三角形  直角边： 5   5   周长： 17.0711
矩形      宽： 3   高： 3   周长： 12

D:\大一下\c++\课上实验\实验10\Shape\x64\Debug\Shape.exe (进程 3824) 已退出，代码为 0。
要在调试停止时自动关闭控制台，请启用“工具”->“选项”->“调试”->“调试停止时自动关闭控制台”。
按任意键关闭此窗口。 . . .

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