中山大学本科生期中考试

考试科目：《程序设计II实验》

学年学期：2024-2025 学年第 2 学期

开课单位：计算机学院

考试方式：上机闭卷

考试时间：100 分钟

【A3】构造矩形类

题目描述

以下有一个 `Rectangle` 类，请完成其构造函数和析构函数。输出的值保留小数点后 2 位。需要使用 float 数组 `attribution_list` 按序存储矩形的长、宽、面积以及周长，`size` 表示该数组的大小。

Rectangle类

```
class Rectangle {
public:
    Rectangle(float length, float width, int len);
    ~Rectangle();

    void rectanglePrint() {
        cout << "The Rectangle's length is " << fixed << setprecision(2) <<
attribution_list[0] << endl;
        cout << "The Rectangle's width is " << fixed << setprecision(2) <<
attribution_list[1] << endl;
        cout << "The Rectangle's area is " << fixed << setprecision(2) <<
attribution_list[2] << endl;
        cout << "The Rectangle's perimeter is " << fixed << setprecision(2) <<
attribution_list[3] << endl;
    }

private:
    float* attribution_list;
    int size;
};
```

样例输入

```
5 3
```

样例输出

```
The Rectangle's length is 5.00
The Rectangle's width is 3.00
The Rectangle's area is 15.00
The Rectangle's perimeter is 16.00
```

`main.cpp`：

```
#include "Rectangle.h"

int main()
{
    float length, width;
    cin >> length >> width;

    Rectangle rectangle(length,width,4);
    rectangle.RectanglePrint();
    return 0;
}
```

`Rectangle.h`：

```
#include <iostream>
#include <string>
#include <iomanip>
using namespace std;


class Rectangle{
public:
    Rectangle(float length, float width, int len);
    ~Rectangle();

    void RectanglePrint()
    {
        cout << "The Rectangle's length is " << fixed << setprecision(2) <<
attribution_list[0] << endl;
        cout << "The Rectangle's width is " << fixed << setprecision(2) <<
attribution_list[1] << endl;
```

```
        cout << "The Rectangle's area is " << fixed << setprecision(2) <<
attribution_list[2] << endl;
        cout << "The Rectangle's perimeter is " << fixed << setprecision(2) <<
attribution_list[3] << endl;
    }

private:
    float* attribution_list;
    int size;
};
```

`Rectangle.cpp`：（答案，仅供参考）

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```
#include "Rectangle.h"

Rectangle::Rectangle(float length, float width, int len) {
    size = len;
    attribution_list = new float[size];
    for (int i=0; i<size; i++) {
        attribution_list[0] = length;
        attribution_list[1] = width;
        attribution_list[2] = length*width;
        attribution_list[3] = (length+width)*2;
    }
}

Rectangle::~Rectangle() {
    delete[] attribution_list;
}
```