3 Exercises

1. Design a stereo graphic class (**CStereoShape** class), and meet the following requirements:

- A virtual function **GetArea**, which can get the surface area of the stereo graphic. Here we let it print out **CStereoShape::GetArea()** and return a value of 0.0, which means that CStereoShape's GetArea is called.
- A virtual function **GetVolume**, which can get the volume of the stereo graphic. Here we let it print out **CStereoShape::GetVolume()** and return a value of 0.0, which means that CStereoShape's GetVolume is called.
- A virtual function **Show**, which print out the description of the stereo graphics. But here we let it print out **CStereoShape::Show()**, which means that Show of CStereoShape is invoked.
- A static private integer variable named **numberOfObject**, whose initial value is 0, which denotes the number of Stereo graphics generated by our program.
- A method named **GetNumOfObject()** that returns the value of numberOfObject.
- Add constructor functions based on requirement.

2. Design a cube class (**CCube** class), which inherits the **CStereoShape** and meets the following requirements:

- A no-arg constructor that creates a default Cube.
- A constructor with parameters whose parameters correspond to the length, width, and height of the cube, respectively.
- A copy constructor that creates a Cube object with the specified object of Cube.
- Override **GetArea**, **GetVolume** of the **CStereoShape** class to complete the calculation of the surface area and volume of the cube, respectively.
- Override **Show()** of the **CStereoShape** class to print out the description (includes length, width, height, the surface area and volume) for the **Cube** object.

3. Design a sphere class (**CSphere** class), which inherits the **CStereoShape** and meets the following requirements:

- A no-arg constructor that creates a default Sphere.
- A constructor with parameters whose parameters correspond to the radius of the Sphere.
- A copy constructor that creates a **Sphere** object with the specified object of Sphere.
- Override **GetArea**, **GetVolume** of the **CStereoShape** class to complete the calculation of the surface area and volume of the sphere, respectively.
- Override **Show()** of the CStereoShape class to print out the description (includes radius, the surface area and volume) for the **Sphere** object.

4. Write a test program and complete at least the following tasks in the main functions:

- Create a **Ccube** object named **a_cube**, which the length, width and height are 4.0, 5.0, 6.0 respectively.
- Create a **CSphere** object named **c_sphere**, which radius is 7.9.
- Define the **CStereoShape** pointer **p**, point **p** to **a_cube**, and then print the information of **a_cube** to the terminal by **p**.
- Point **p** to **c_sphere**, then print the information of **c_sphere** to the terminal by p.
- Points out the **number** of Stereo graphics created by the test program.

Note that you may need to use the “setf( )” and “precision( )” formatting methods to set output mode.

Output sample:

```
Cube lenght:4   width:5 height:6
Cube area:108   volume:120
Sphere radius:7.9       area:783.87     volume:2064.19
2 objects are created.
```