

Not every Sphere is the same... is it?

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sphere.h		sphere.cpp	
1	#ifndef SPHERE_H	...	/* ... */
2	#define SPHERE_H	10	
3	class Sphere {	11	
4	public:	12	
5	// ...	13	
...		14	
20		15	
21		16	
22		17	
23	private:	18	
24	double r_;	19	
25		20	
26		21	
27		22	
28		23	
29	};	24	
30	#endif	25	
		26	
		27	
		28	
		29	
		30	
		31	
		32	
		33	
		34	
		35	
		36	
		37	
		38	
		39	
		...	/* ... */

redSphere-main.cpp	
5	int main() {
6	cs225::Sphere s(10);
7	s.addProperty("Red");
8	s.addProperty("Rubber");
9	return 0;
10	}

Big Idea: Inheritance

RedBall.h		RedBall.cpp	
1	#ifndef REDBALL_H	1	
2	#define REDBALL_H	2	
3		3	
4	#include "Sphere.h"	4	
5		5	
6	class RedBall	6	
7	public:	7	
8		8	
9		9	
10		10	
11		11	
12		12	
13	private:	13	
14		14	
15		15	
16	};	16	
17		17	
18	#endif	18	

A _____:

1. [Constructor]:
2. [Inherits]:
3. [Inherits]:

Functions: non-virtual, virtual, and pure virtual

Sphere.cpp	RedBall.cpp
<pre>Sphere::print_1() { cout << "Sphere" << endl; } Sphere::print_2() { cout << "Sphere" << endl; } virtual Sphere::print_3() { cout << "Sphere" << endl; } virtual Sphere::print_4() { cout << "Sphere" << endl; } // .h: virtual Sphere::print_5() = 0;</pre>	<pre>// No print_1() defined // in RedBall RedBall::print_2() { cout << "Ball" << endl; } // No print_3() defined // in RedBall RedBall::print_4() { cout << "Ball" << endl; } RedBall::print_5() { cout << "Ball" << endl; }</pre>

	Sphere obj;	RedBall obj;	RedBall r; Sphere &obj = r;
obj.print_1();			
obj.print_2();			
obj.print_3();			
obj.print_4();			
obj.print_5();			

Abstract Class

1. [Requirement]:
2. [Syntax]:
3. [Therefore]:

Reasoning about virtual classes:

virtual-ctor.cpp	
15	class Sphere {
16	public:
17	virtual Sphere();
18	}
19	
20	class Ball : Sphere() {
21	public:
22	_____;
23	}
24	

virtual-dtor.cpp	
15	class Sphere {
16	public:
17	virtual ~Sphere();
18	}
19	
20	class Ball : Sphere() {
21	public:
22	_____;
23	}
24	

In what order does the derived classes ctor/dtor get called?

- 1.
- 2.
- 3.
- 4.

CS 225 – Things To Be Doing:

1. Exam #1 (CBTF) is ongoing; Register for Exam #2
2. MP2 is out! (*start early for +EC!*)
3. Lab Extra Credit → Attendance in your registered lab section!
4. POTDs