CodeStepByStep

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Language/Type: C++ inheritance polymorphism

Consider the following classes; assume that each is defined in its own file.

```
class Computer : public Animal {
public:
    virtual void two() {
        cout << "C 2" << endl;
        Mineral::two();
    }

    virtual void three() {
        cout << "C 3" << endl;
    }
};

class Mineral : public Vegetable {
public:
    virtual void one() {
        cout << "M 1" << endl;
    }

    virtual void two() {
        cout << "M 2" << endl;
    }
};

class Animal : public Mineral {
public:
    virtual void one() {
        cout << "A 1" << endl;
        two();
    }

    virtual void three() {
        cout << "A 3" << endl;
    }
};
```

```
class Vegetable {
public:
    virtual void two() {
        cout << ”V 2” << endl;
    }
};
```

Now assume that the following variables are defined:

```
Vegetable* var1 = new Computer();
Mineral*   var2 = new Animal();
Vegetable* var3 = new Vegetable();
Animal*    var4 = new Computer();
```

In the table below, indicate in the right-hand column the output produced by the statement in the left-hand column. If the statement produces more than one line of output, indicate the line breaks with slashes as in "x / y / z" to indicate three lines of output with "x" followed by "y" followed by "z". If the statement does not compile, write "COMPILER ERROR". If a statement would crash at runtime or cause unpredictable behavior, write "CRASH".

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var1->one();	COMPILER ERROR
var1->two();	C 2 / M 2
var1->three();	COMPILER ERROR
var2->one();	A 1 / M 2
var2->two();	M 2
var3->one();	COMPILER ERROR
var3->two();	V 2
var4->one();	A 1 / C 2 / M 2
var4->three();	C 3
((Animal*) var1)->one();	A 1 / C 2 / M 2
((Mineral*) var1)->two();	C 2 / M 2
((Computer*) var1)->three();	C 3
((Vegetable*) var2)->three();	COMPILER ERROR
((Animal*) var2)->one();	A 1 / M 2
((Computer*) var4)->two();	C 2 / M 2

`((Computer*) var4)->three();` C 3

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✓ You passed 16 of 16 tests.

#	question	your answer	result
1	`var1->one();`	COMPILER ERROR	✓ pass
2	`var1->two();`	C 2 / M 2	✓ pass
3	`var1->three();`	COMPILER ERROR	✓ pass
4	`var2->one();`	A 1 / M 2	✓ pass
5	`var2->two();`	M 2	✓ pass
6	`var3->one();`	COMPILER ERROR	✓ pass
7	`var3->two();`	V 2	✓ pass
8	`var4->one();`	A 1 / C 2 / M 2	✓ pass
9	`var4->three();`	C 3	✓ pass
10	`((Animal*) var1)->one();`	A 1 / C 2 / M 2	✓ pass
11	`((Mineral*) var1)->two();`	C 2 / M 2	✓ pass
12	`((Computer*) var1)->three();`	C 3	✓ pass
13	`((Vegetable*) var2)->three();`	COMPILER ERROR	✓ pass
14	`((Animal*) var2)->one();`	A 1 / M 2	✓ pass
15	`((Computer*) var4)->two();`	C 2 / M 2	✓ pass
16	`((Computer*) var4)->three();`	C 3	✓ pass

Need help?

Stuck on an exercise? Contact your TA or instructor.

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