# Tracing Inheritance

To determine the output of a polymorphic program, you must determine what happens when its methods are called. If you encounter a problem with constant output (no dependence on object state or parameters), you should use the following steps to help you solve the problem:

## Step 1

Draw a diagram of the classes and their methods to see the hierarchy ordering and which methods exist in each class. As seen in the example below, draw each class as a box listing its methods, then connect subclasses to their superclasses with arrows that point to the superclass. To find the superclass in a complicated program, look for a class header that does not use the *extends* keyword.

Class A

methods included in class A

Class C

methods included in class C

Class B

methods included in class B

Class D

methods included in class D

Step 2

Create a table that lists each class and its methods output. Write the output for the methods defined in each class AND for the methods that the class inherits.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| method0 | output | output | output | output |
| method1 | output | output | output | output |
| method2 | output | output | output | output |

Step 3

Using the table you created, determine the output of the client code. When a method gets called on an object, look up the output of that method for that type in the table.