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Quiz 3.5 – Inheritance

Consider the following code. For each numbered line in the client program, indicate:

- whether or not the code will compile
- if the code compiles, whether or not it will execute without an exception
- what output, if any will be produced

If a line of code will not compile or will produce an exception, assume it is commented out when evaluating later lines.

```
public class A {
   public A() {
      System.out.println("A()");
   }

   public void method1() {
      System.out.println("A.method1()");
      method2();
   }

   public void method2() {
      System.out.println("A.method2()");
   }
}
```

```
public class B extends A {
   public B() {
      System.out.println("B()");
   }

   public void method2() {
      System.out.println("B.method2()");
      method3();
   }

   public void method3() {
      System.out.println("B.method3()");
      super.method2();
   }
}
```

```
public class C extends B {
   public C() {
      System.out.println("C()");
   }

   public void method1() {
      super.method1();
      System.out.println("C.method1()");
   }

   public void method3() {
      System.out.println("C.method3()");
   }
}
```

```
public class D extends A {
   public D() {
      System.out.println("D()");
   }

   public void method2() {
      System.out.println("D.method2()");
   }
}
```

```
public class Client {
   public static void main(String[] args) {
      A a = new A();    // Line 1
      B b = new C();    // Line 2
      C c = new B();    // Line 3
      D d = new D();    // Line 4

      b.method2();      // Line 5
      ((A)b).method3(); // Line 6
      System.out.println();

      d.method3();      // Line 7
      d.method1();      // Line 8
      B b2 = (B)d;      // Line 9
      System.out.println();

      A a2 = new B();   // Line 10
      a2.method1();     // Line 11
      C c2 = (C)a2;     // Line 12
      System.out.println();

      A[] aArr = { new A(), new B(),
                   new C(), new D() };  // Line 13
      ((B)aArr[0]).method3(); // Line 14
      aArr[1].method2();      // Line 15
      aArr[2].method3();      // Line 16
      aArr[3].method1();      // Line 17
   }
}
```