Inheritance in Java

```
public class Person
{
 private String name;
 …
}
```

```
public class Student
{
 private String name;
 …
}
```

```
public class Faculty
{
 private String name;
 …
}
```

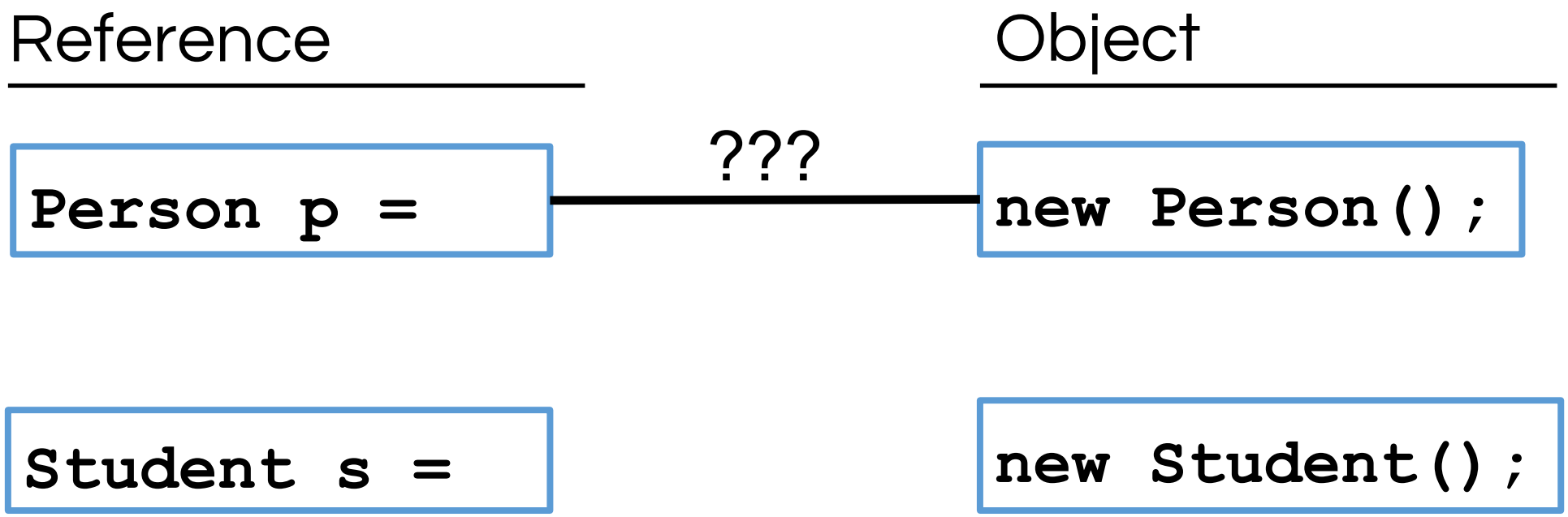
What did we want?

1. Keep common behavior in one class
2. Split different behavior into separate classes
3. Keep all of the objects in a single data structure

```
public class Person {
 private String name;
 public String getName() {return name;}
}
```

```
public class Student extends Person {
 private int id;
 public int getID() {return id;}
}
```

```
public class Faculty extends Person {
 private String id;
 public String getID() {return id;}
}
```



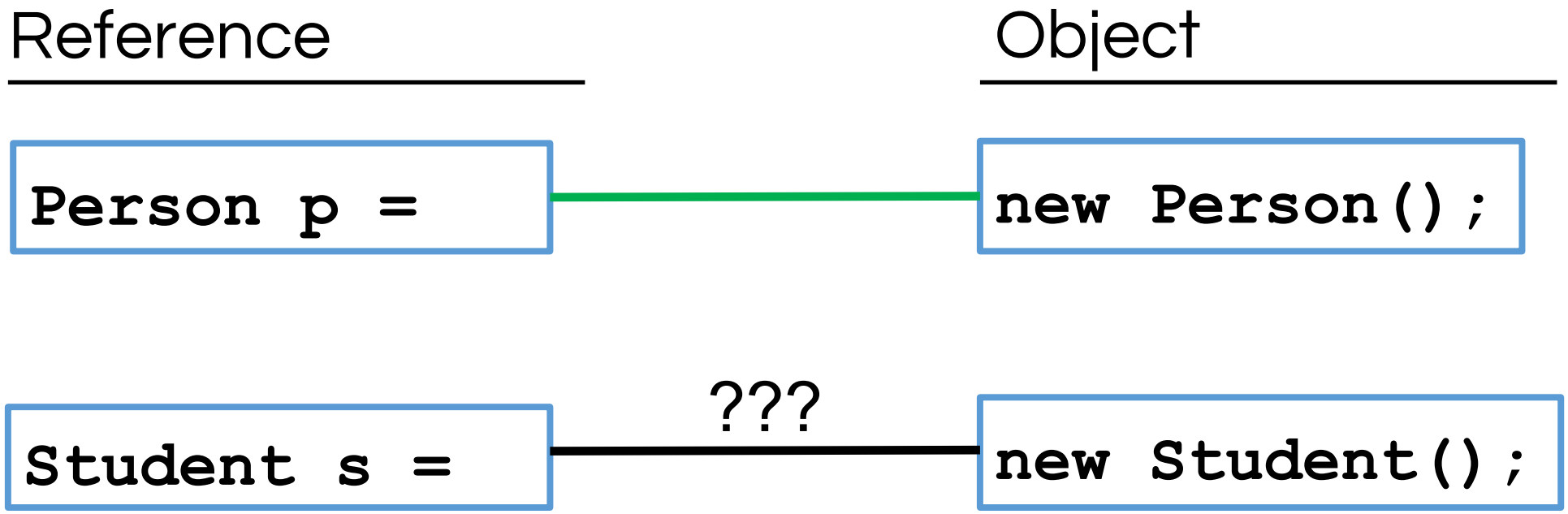

```
Person p = new Person();
```

Reference

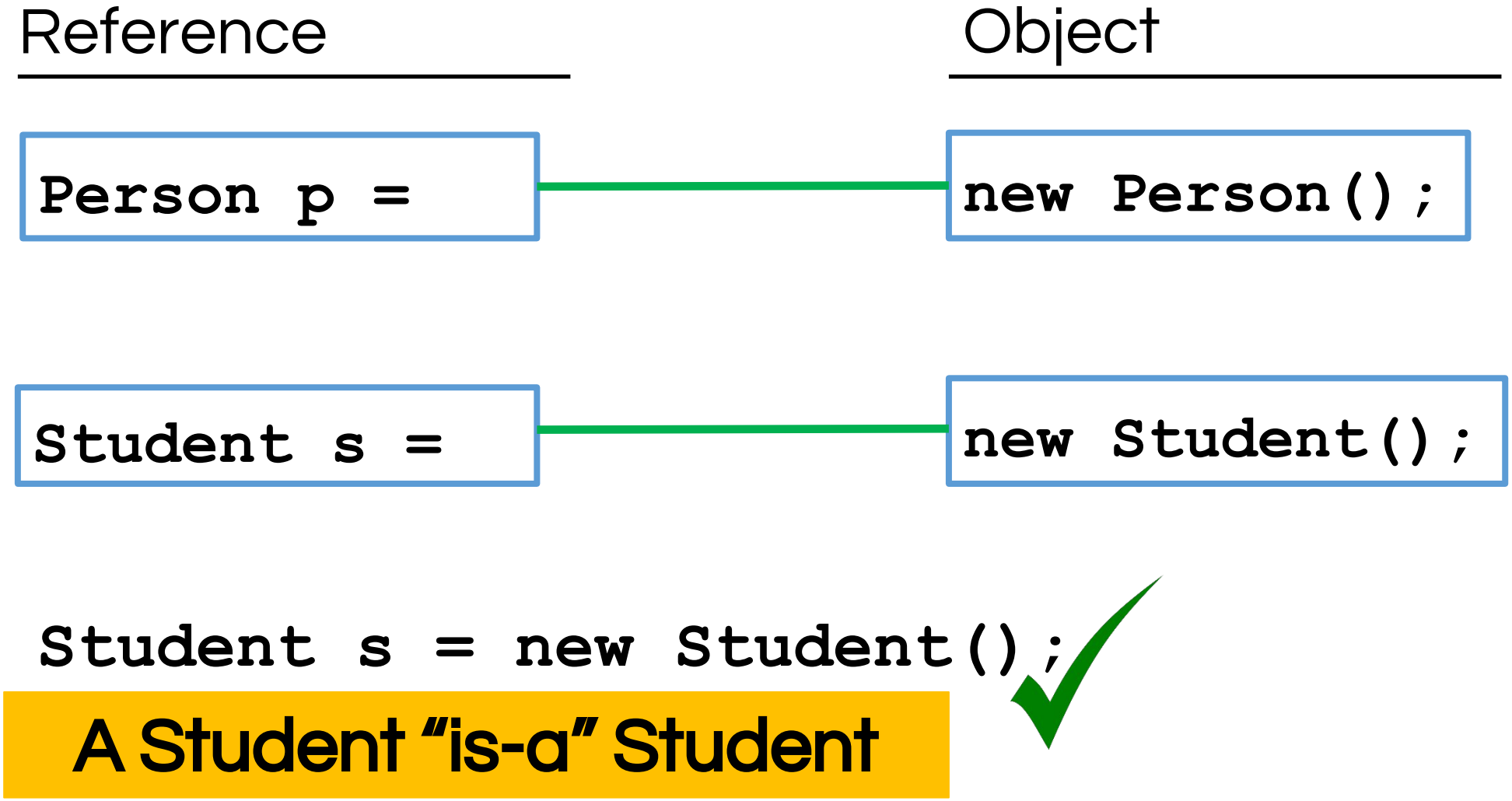
Object


```
Person p = new Person();
```

A Person “is-a” Person

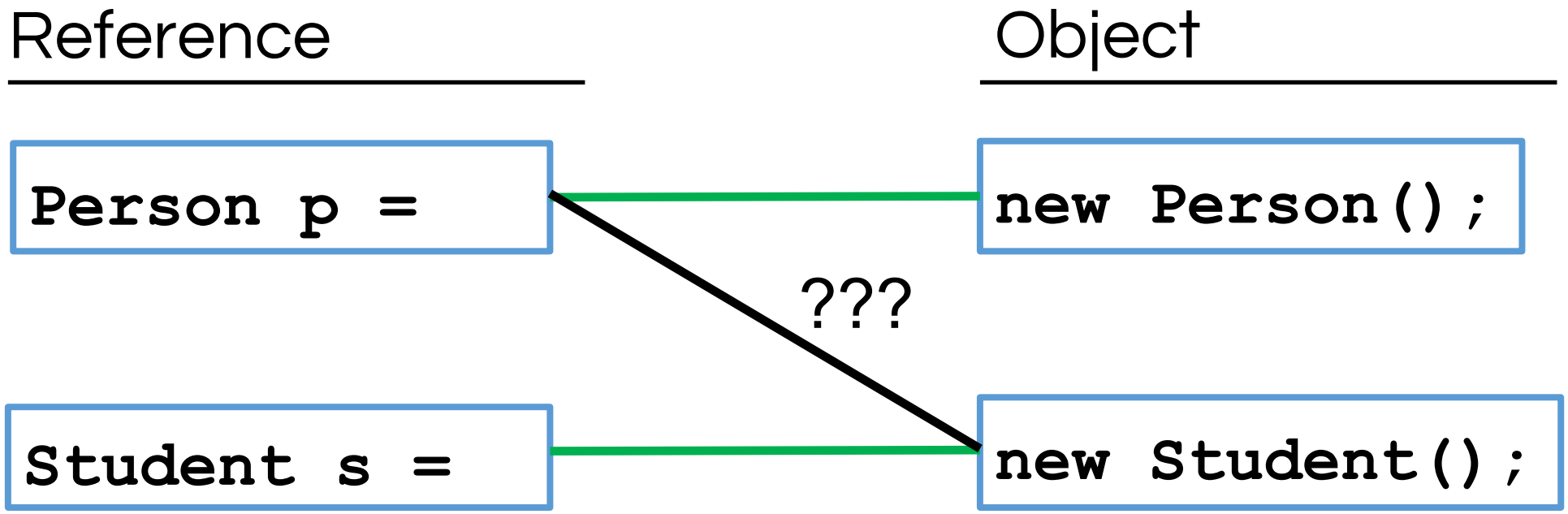



```
Student s = new Student();
```

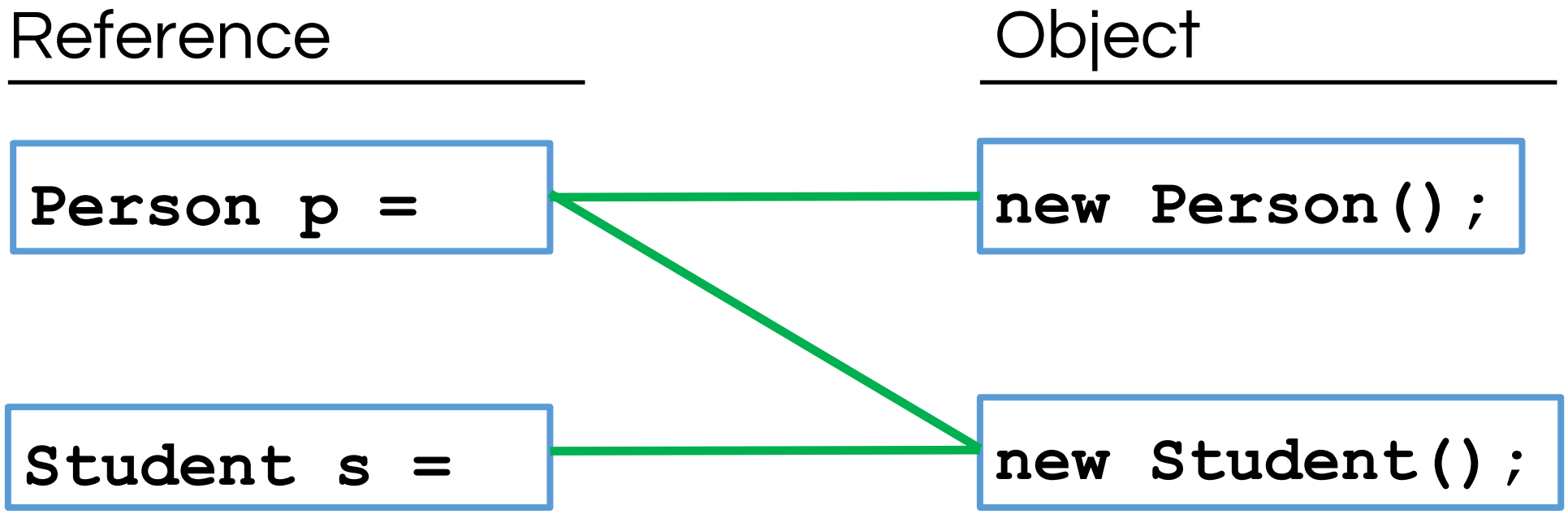



```
Student s = new Student();
```

A Student “is-a” Student




```
Person p = new Student();
```

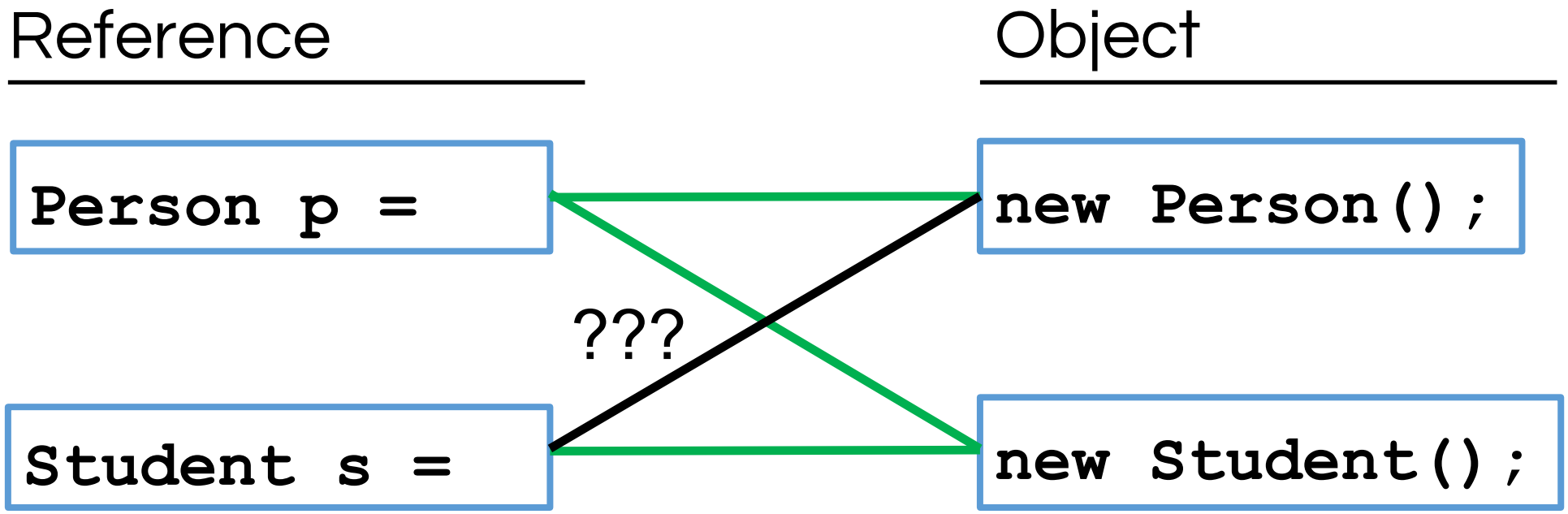



```
Person p = new Student();
```

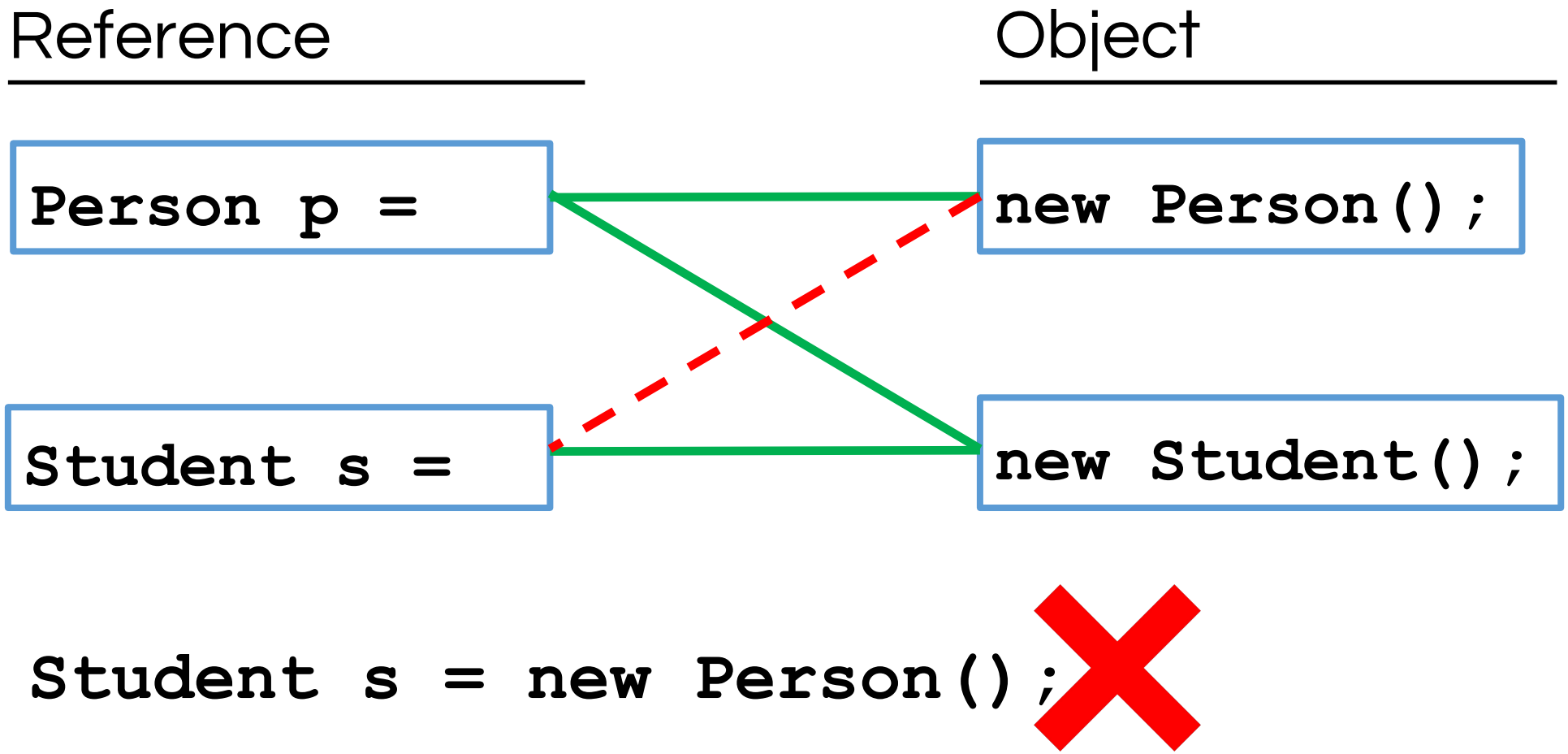
A Student "is-a" Person

```
// in main
Person[] p = new Person[3];
p[0] = new Person();
p[1] = new Student();
p[2] = new Faculty();
```

A Person array CAN store Student and Faculty objects




```
Student s = new Person();
```




```
Student s = new Person();
```

```
public class Person {
 private String name;
 public String getName() {return name;}
}
```

```
public class Student extends Person {
 private int id;
 public int getID() {return id;}
}
```

```
public class Faculty extends Person {
 private String id;
 public String getID() {return id;}
}
```

```
Student s = new Student();
Person p = new Person();
Person q = new Person();
Faculty f = new Faculty();
Object o = new Faculty();
```

```
String n = s.getName();
```

```
public class Person
{
 private String name;
 …
}
```

```
public class Student extends Person
{
 private String name;
 …
}
```

Private vars can be accessed only through public methods!

What is inherited?

- Public instance variables
- Public methods
- Private instance variables

```
public class Person {
 private String name;
 public String getName() {return name;}
}
```

```
public class Student extends Person {
 private int id;
 public int getID() {return id;}
}
```

```
public class Faculty extends Person {
 private String id;
 public String getID() {return id;}
}
```

```
Student s = new Student();
Person p = new Person();
Person q = new Person();
Faculty f = new Faculty();
Object o = new Faculty();
```

```
String n = s.getName();
p = s;
```

```
public class Person {
 private String name;
 public String getName() {return name;}
}
```

```
public class Student extends Person {
 private int id;
 public int getID() {return id;}
}
```

```
public class Faculty extends Person {
 private String id;
 public String getID() {return id;}
}
```

```
Student s = new Student();
Person p = new Person();
Person q = new Person();
Faculty f = new Faculty();
Object o = new Faculty();
```

```
String n = s.getName();
p = s;
int m = p.getID();
```

```
public class Person {
 private String name;
 public String getName() {return name;}
}
```

```
public class Student extends Person {
 private int id;
 public int getID() {return id;}
}
```

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public class Faculty extends Person {
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```
Student s = new Student();
Person p = new Person();
Person q = new Person();
Faculty f = new Faculty();
Object o = new Faculty();
```

```
String n = s.getName();
p = s;
int m = p.getID();
f = q;
```

```
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public class Student extends Person {
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Person p = new Person();
Person q = new Person();
Faculty f = new Faculty();
Object o = new Faculty();
```

```
String n = s.getName();
p = s;
int m = p.getID();
f = q;
o = s;
```