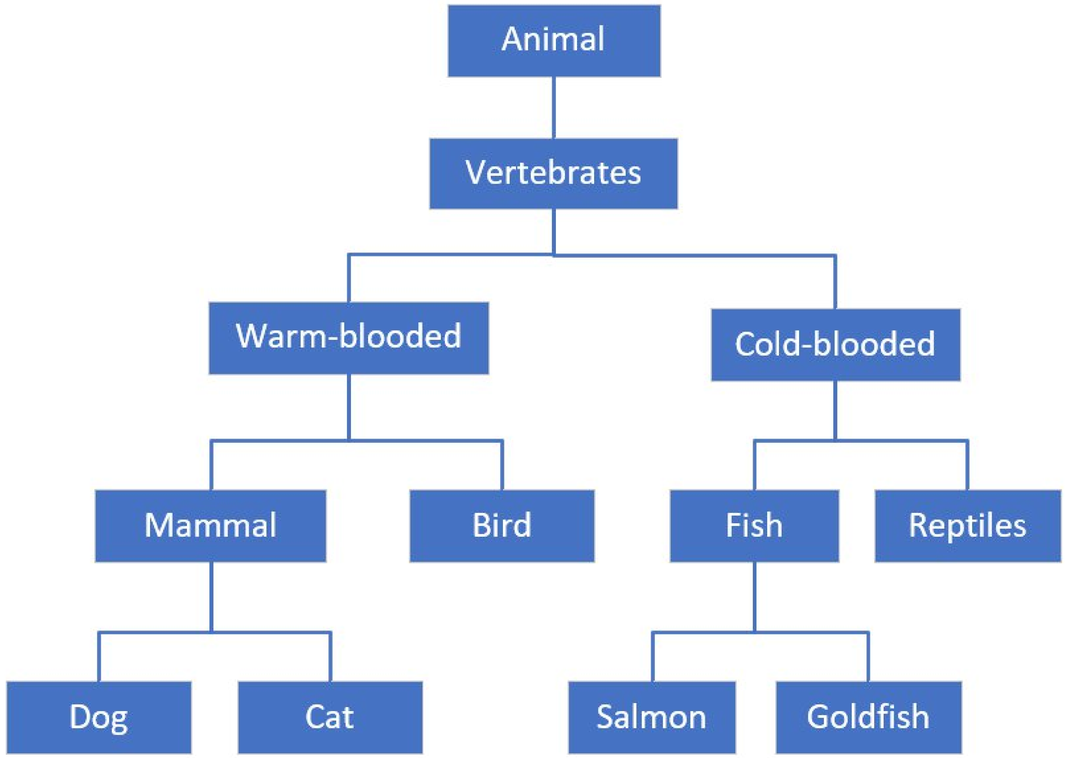
Inheritance

What is Inheritance, and why is it so powerful?

We can look at Inheritance as a form of code reuse.

It's a way to organize classes into a parent-child hierarchy, which lets the child inherit (reuse), fields and methods from its parent.

Inheritance



Each box on this diagram represents a Class.

The most generic, or base class, starts at the top of the hierarchy.

Every class below it is a subclass.

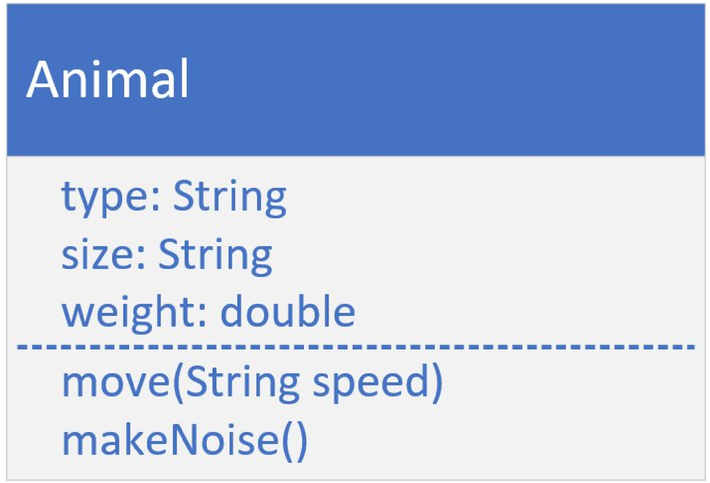
So Animal is the base class. All the other classes can be said to be subclasses of Animal.

A parent can have multiple children, as we see with Mammal, which is the parent of Dog and Cat.

A child can only have one direct parent in Java.

But it will inherit from its parent class's parent and so on.

The Animal class

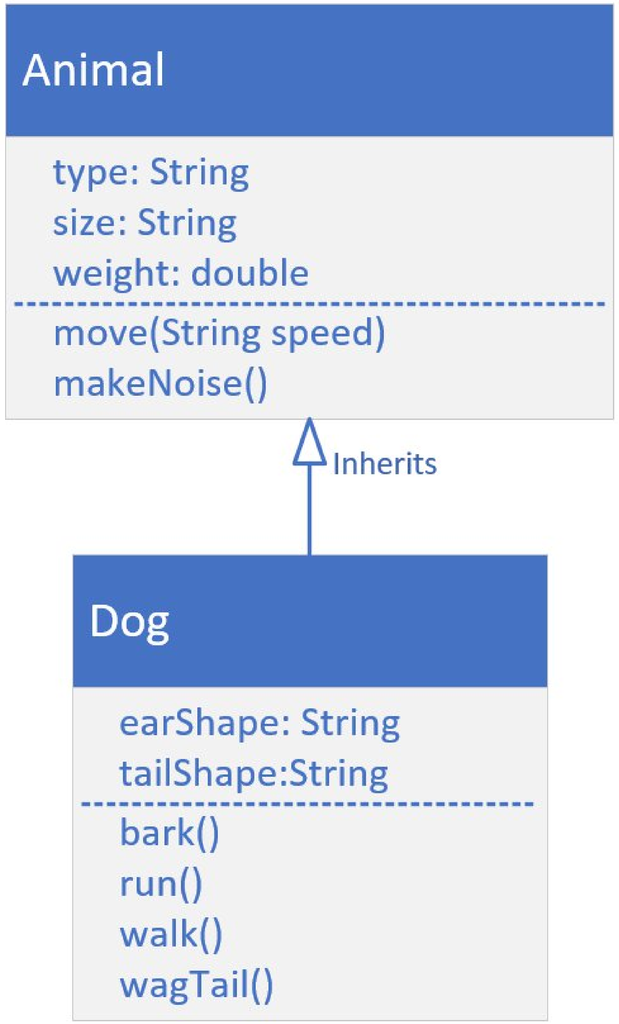


A class diagram allows us to design our classes before we build them.

This diagram shows the Animal class with the attributes I think that every kind of animal has.

Below the fields, I have the behavior that animals have in common: move and makeNoise.

Class Model for Animal and Dog



Dog inherits from Animal.

In other words, Dog "IS A" type of Animal.

When I create a Dog object, it will inherit Animal's attributes (type, size, and weight).

This is also true for Animal's methods. Dog will inherit these as well.

I can specialize the Dog class with its own fields and behavior.

extends

Using extends specifies the superclass (or the parent class) of the class we're declaring.

I can say Dog is a subclass or child class of Animal.

I can say Animal is a parent or super class of Dog.

A class can specify one and only one class in its extends clause.

super()

super() is a lot like this().

It's a way to call a constructor on the super class directly from the sub class's constructor.

Like this(), it has to be the first statement of the constructor.

Because of that rule, this() and super() can never be called from the same constructor.

super()

If you don't make a call to super(), then Java makes it for you using super's default constructor.

If your super class doesn't have a default constructor, then you must explicitly call super() in all of your constructors, passing the right arguments to that constructor.