



Is-A, Has-A, Objects, and Classes

An important concept that you have to understand is the difference between a class and an object. The problem is, there is no real “difference” between a class and an object. They are actually the same thing at different points in time. I will demonstrate by a Zen koan:

What is the difference between a Fish and a Salmon?

Did that question sort of confuse you? Really sit down and think about it for a minute. I mean, a Fish and a Salmon are different but, wait, they are the same thing, right? A Salmon is a *kind* of Fish, so I mean it’s not different. But at the same time, because a Salmon is a particular *type* of Fish, it’s actually different from all other Fish. That’s what makes it a Salmon and not a Halibut. So a Salmon and a Fish are the same but different. Weird.

This question is confusing because most people do not think about real things this way, but they intuitively understand them. You do not need to think about the difference between a Fish and a Salmon because you *know* how they are related. You know a Salmon is a *kind* of Fish and that there are other kinds of Fish without having to understand that.

Let’s take it one step further: say you have a bucket full of three Salmon and, because you are a nice person, you have decided to name them Frank, Joe, and Mary. Now, think about this question:

What is the difference between Mary and a Salmon?

Again, this is a weird question, but it’s a bit easier than the Fish versus Salmon question. You know that Mary is a Salmon, and so she’s not really different. She’s just a specific “instance” of a Salmon. Joe and Frank are also instances of Salmon. What do I mean when I say “instance”? I mean they were created from some other Salmon and now represent a real thing that has Salmon-like attributes.

Now for the mind-bending idea: Fish is a class, and Salmon is a class, and Mary is an object. Think about that for a second. Alright let’s break it down real slow and see if you get it.

A Fish is a class, meaning it’s not a *real* thing, but rather a word we attach to instances of things with similar attributes. Got fins? Got gills? Lives in water? Alright it’s probably a Fish.

Someone with a PhD then comes along and says, “No, my young friend, *this* Fish is actually *Salmo salar*, affectionately known as a Salmon.” This professor has just clarified the Fish further and made a new class called “Salmon” that has more specific attributes. Longer nose, reddish flesh, big, lives in the ocean or fresh water, tasty? OK, probably a Salmon.