Extract from Object First by David Barnes and Michael Kolling:

Objects and Classes

If you write a computer program in an object-oriented language, you are creating, in your computer, a model of some part of the world. The parts that the model is built up from are the objects that appear in the problem domain. These objects must be represented in the computer model being created. The objects from the problem domain vary with the program you are writing. They may be words or paragraphs if you are programming a word processor, users and messages if you are working on a socialnetwork system or monsters if you are writing a computer game.

Objects may be categorized. A class describes, - in an abstract way, - all objects of a particular kind.

We can make these abstract notions clearer by looking at an example. Assume you want to model a traffic simulation. One kind of entity you then have to deal with is cars. What is a car in our context? Is it a class or an object? A few questions may help us to make a decision.

What color is a car? How fast can it go? Where is it right now?

You will notice that we cannot answer these questions until we talk about one specific car. The reason is that the word "car" in this context refers to the *class* car; we are talking about cars in general, not about one particular car.

If I speak of "my old car that is parked at home in my garage," we can answer the questions above. That car is red, it doesn't go very fast, and it is in my garage. Now I am talking about an *object* – about one particular example of a car.

We usually refer to a particular object as an *instance*. We shall use the term "instance" quite regularly from now on. "Instance" is roughly synonymous with "object"; we refer to objects as instances when we want to emphasize that they are of a particular class (such as "this object is an instance of the class car").

The following entities can represent classes or objects: Sphere, Polygon, Time, Clock, Rectangle, Person, Professor, College, President, and Band. For each entity, write one or two questions that can be useful in distinguishing between objects of the class.

Sphere:

1. What is the volume of a sphere?
2. What is the surface area of a sphere?

Time:

1. How many hours has it been since midnight?
2. What is the closest whole hour?

Rectangle:

1. What is the length of the longer side of a rectangle?
2. What is the distance between the corners of a rectangle?

Person:

1. What is the person's name?
2. How tall is the person?

College:

1. What is the acceptance rate of the college?
2. How many students attend the college?