What is logic?

Formal logic is distinguished from other branches of philosophy by the way it achieves content neutrality. That is to say that logic is neutral about the content of the argument it evaluates. Logic takes radical measures to ensure content neutrality: it removes the parts of a statement that tie it to particular objects in the world and replaces them with abstract symbols. In a more general sense, logic may be defined as the organized body of knowledge, or science, that evaluates *arguments*. Consider the following two arguments:

P1: Socrates is a person.
P2: All persons are mortal.
C: Socrates is mortal.

P1: Socrates is a person.
P2: All people are carrots.
C: Socrates is a carrot.

These arguments are both 'good' in special sense. In each case, if the premises were true, the conclusion would have to be true. What makes these arguments good is that they are both based on true claims, but that they are put together in the right sort of way. Another way of thinking about this is to say that they have the same logical *form*. Both arguments can be written like this:

P1: S is P.
P2: All P are M.
C: S is M.

In both arguments S stands for Socrates and P stands for person. In the first argument, M stands for mortal; in the second, M stands for carrot. The letters `S', `M', and `P' are variables. They are just like the variables you may have learned about in algebra class. In algebra, you had equations like y = 2x + 3, where x and y were variables that could stand for any number. Just as x could stand for any number in algebra, all the letters of the alphabet can stand for any part of a sentence or an entire sentence in logic.

This explanation of logic may appear unintuitive. Many of us use the word 'logic' in our daily discourse, but probably did *not* have anything in mind like what I described above. In fact, some of us seem to use the word 'logic' in a psychological sense. As the semester progresses I will at times appeal to this sense of 'logic' to make certain reasoning principles more intuitive. This class, however, is not assuming that the logics (yes, plural!) we will be studying in any sense mirror or represent human reasoning. That would be the kind of topic explored in a philosophy of logic and/or psychology class.

Another way of thinking about what logic is, is to think about games. Despite there being a great variety in what can and cannot be considered a game, there does seem to be at least one necessary condition for something to be a game: it has to have rules. Twister, chess, ping pong, etc., all have rules about when a legal move has and has not been made. The winner of a game is the person(s) who followed all of the rules to achieve the objective. If it helps you to conceptualize of what logic in this manner, then please see what we are doing as playing a variety of games...and if this helps you have some fun, then even better!