The earliest formal logic was developed by the Greek philosopher Aristotle in the fourth century B.C. Aristotelian logic is based on the **syllogism**, of which he invented fourteen types. Five more were invented in medieval times. Syllogisms have two **premises** and one **conclusion**, which is inferred from the premises. The following is a classic example of a syllogism:
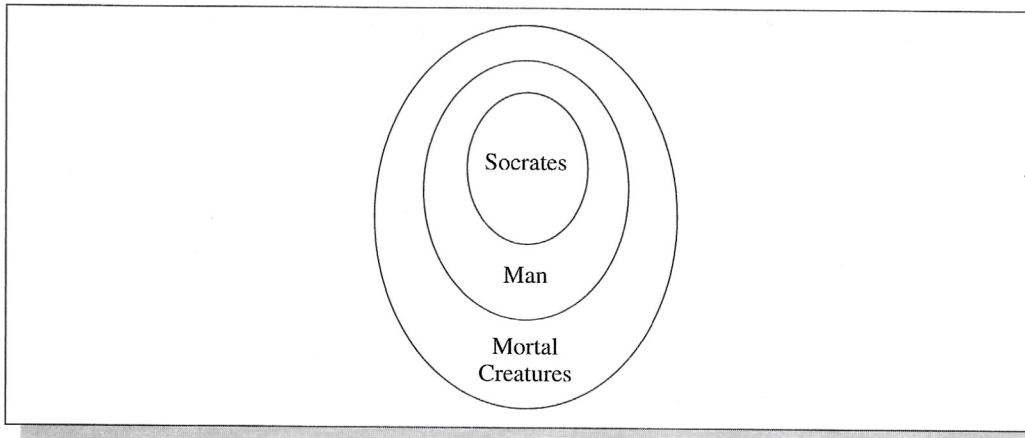
```
Premise:    All men are mortal
Premise:    Socrates is a man
Conclusion: Socrates is mortal
```

In a syllogism the **premises** provide the evidence from which the conclusion must necessarily follow. A syllogism is a way of representing knowledge. Another way is a **Venn diagram**, as shown in Figure 2.13.

Figure 2.13 Venn Diagram

The outer circle represents all mortal creatures. The inner circle representing men is drawn entirely within the mortal circle to indicate that all men are mortal. Since Socrates is a man, the circle representing him is drawn entirely within the human circle. Strictly speaking, the circle representing Socrates should be a point, since a circle implies a class. For readability, we'll use circles for all. The conclusion that Socrates is mortal is a consequence of the fact that his circle is within that of mortal creatures and so he must be mortal.

In mathematical terms, a circle of the Venn diagram represents a **set**, which is a collection of objects. The objects within a set are called its **elements**. Some examples of sets are the following:

```
A = {1,3,5}
B = {1,2,3,4,5}
C = {0,2,4,...}
D = {...,-4,-2,0,2,4,...}
E = {airplanes,balloons,blimps,jets}
F = {airplanes,balloons}
```