Abstract: This tutorial on Aristotle’s underlying logic begins with a treatment of his demonstrative logic, the principal motivation for his interest in the field. Demonstrative logic is the study of demonstration as opposed to persuasion. It presupposes the Socratic knowledge/belief distinction – between knowledge (beliefs that are known) and opinion (those that are not known). Demonstrative logic is the subject of Aristotle’s two-volume Analytics, as he said in the first sentence. Many of his examples are geometrical. Every demonstration produces (or confirms) knowledge of (the truth of) its conclusion for every person who comprehends the demonstration. Persuasion merely produces opinion. Aristotle presented a general truth-and-consequence conception of demonstration meant to apply to all demonstrations. According to him, a demonstration is an extended argumentation that begins with premises known to be truths and that involves a chain of reasoning showing by deductively evident steps that its conclusion is a consequence of its premises. In short, a demonstration is a deduction whose premises are known to be true. For Aristotle, starting with premises known to be true, the knower demonstrates a conclusion by deducing it from the premises. As Tarski emphasized, formal proof in the modern sense results from refinement and “formalization” of traditional Aristotelian demonstration. Aristotle’s general theory of demonstration required a prior general theory of deduction presented in the Prior Analytics. His general immediate-deduction-chaining conception of deduction was meant to apply to all deductions. According to him, any deduction that is not immediately evident is an extended argumentation that involves a chaining of immediately
evident steps that shows its final conclusion to follow logically from its premises. To illustrate his general theory of deduction, he presented an ingeniously simple and mathematically precise special case traditionally known as the *categorical syllogistic*. With reference only to propositions of the four so-called categorical forms, he painstakingly worked out exactly what those immediately evident deductive steps are and how they are chained. In his specialized theory, Aristotle explained how to deduce from a given categorical premise set, no matter how large, any categorical conclusion implied by the given set. He did not extend this treatment to non-categorical deductions, thus setting a program for future logicians.

We will also treat several metatheorems about his basic system and about various extensions and subsystems. In particular, we show that one-one translation of Aristotle’s system into a certain fragment of modern Hilbertian many-sorted logic yields a complete match in the following sense. In order for an conclusion to be a consequence of a given premises set according to Aristotle it is necessary and sufficient for the many-sorted translation of the conclusion $t$ to be a consequence of translated premises according to Hilbert.

**KEYWORDS:** demonstration, deduction, direct, indirect, categorical syllogistic, premise, conclusion, implicant, consequence, belief, knowledge, opinion, cognition, intuitive, demonstrative, complete, independent.