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LOGIC

An introduction

Fundamentals of Philosophy
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Introduction

For the student

There are many different reasons to study logic. Logic is the theory of *good reasoning*. Studying logic not only helps you to reason well, but it also helps you *understand* how reasoning works.

Logic can be done in two ways—it can be *formal* and it can be *philosophical*. This book concentrates on *both* aspects of logic. So, we'll be examining the techniques that logicians use in *modelling* good reasoning. This 'modelling' is formal and technical, just like the formal modelling you see in other disciplines, such as the physical and social sciences and economics.

The philosophical aspects of logic are also important, because we try not only to model good reasoning, but also to understand *why* things work the way they do—or to understand why things *don't* work. So, we will not only learn formal techniques, we will also *analyse* and *interpret* those techniques.

So, the techniques of logic are *abstract* and *rigorous*. They're abstract, since we concentrate on particular properties of reasoning that are relevant to our goals. They're rigorous, since we try to define all of the terms we use, and we take our definitions seriously. The goal is for us to *understand* what we are doing as much as possible.

The techniques of formal logic can be used in many different ways. The things we learn can be applied in philosophy, mathematics, computing, linguistics, and many other domains. Logic is important for *philosophy* as reasoning and argumentation form a core part of philosophy. Logic is important in *mathematics* because the formalisation of logic is important when it comes to the study of mathematical theories and mathematical structures: in fact, many of the techniques we will be looking at arose in the study of mathematics. Logic is important in *computing* because the process of describing a problem or process to be implemented in a computer is a problem of formalisation. Furthermore, the kinds of algorithms or recipes we use in solving problems in logic are useful in problems that can be found in computing. Logic is important in *linguistics* because the formal languages used in the study of logic provide helpful models for linguistic theories.

So, logic has its place in many different disciplines. More generally even than that, learning logic helps you to learn how to be precise and rigorous in any area of study.

This book is a self-contained introduction to logic. You should not *have* to read anything else in order to get a well-rounded introduction to logic. However, other books will complement the introduction you will find here. Here are some useful books that complement the approach to logic I have taken. (Numbers in square brackets are references to entries in the bibliography.)