

Contents

Preface *ix*

I HARDWARE

- 1 Boolean Logic 9
- 2 Boolean Arithmetic 31
- 3 Memory 45
- 4 Machine Language 61
- 5 Computer Architecture 83
- 6 Assembler 103

II SOFTWARE

- 7 Virtual Machine I: Processing 125
- 8 Virtual Machine II: Control 147
- 9 High-Level Language 171
- 10 Compiler I: Syntax Analysis 191
- 11 Compiler II: Code Generation 211
- 12 Operating System 245
- 13 More Fun to Go 273

Appendices	<i>277</i>
1 Boolean Function Synthesis	<i>277</i>
2 Hardware Description Language	<i>283</i>
3 Test Description Language	<i>299</i>
4 The Hack Chip Set	<i>313</i>
5 The Hack Character Set	<i>315</i>
6 The Jack OS API	<i>317</i>
Index	<i>321</i>