

# Contents

<b>1. Introduction</b> .....	1
1.1 Outline of the Book .....	1
1.2 Setting the Scene .....	5
1.3 Introduction to Learning .....	10
1.4 Introduction to Logic .....	16
Bibliographical Notes .....	27
Exercises .....	28
<b>2. Logic</b> .....	31
2.1 Types .....	31
2.2 Type Substitutions .....	35
2.3 Terms .....	38
2.4 Subterms .....	45
2.5 Term Substitutions .....	55
2.6 $\lambda$ -Conversion .....	64
2.7 Model Theory .....	72
2.8 Proof Theory .....	76
Bibliographical Notes .....	79
Exercises .....	80
<b>3. Individuals</b> .....	83
3.1 Default Terms .....	83
3.2 Normal Terms .....	89
3.3 An Equivalence Relation on Normal Terms .....	93
3.4 A Total Order on Normal Terms .....	95
3.5 Basic Terms .....	97
3.6 Metrics on Basic Terms .....	105
3.7 Kernels on Basic Terms .....	115
Bibliographical Notes .....	127
Exercises .....	128
<b>4. Predicates</b> .....	131
4.1 Transformations .....	131
4.2 Standard Predicates .....	139

4.3	Regular Predicates .....	146
4.4	Predicate Rewrite Systems.....	151
4.5	The Implication Preorder.....	158
4.6	Efficient Construction of Predicates .....	163
	Bibliographical Notes .....	175
	Exercises .....	176
<b>5.</b>	<b>Computation</b> .....	<b>183</b>
5.1	Programs as Equational Theories .....	183
5.2	Definitions of Some Basic Functions .....	188
5.3	Programming with Abstractions.....	193
	Bibliographical Notes .....	203
	Exercises .....	203
<b>6.</b>	<b>Learning</b> .....	<b>207</b>
6.1	Decision-Tree Learning .....	207
6.2	Illustrations .....	214
	Bibliographical Notes .....	240
	Exercises .....	241
<b>A.</b>	<b>Appendix</b> .....	<b>243</b>
A.1	Well-Founded Sets.....	243
	<b>References</b> .....	<b>245</b>
	<b>Notation</b> .....	<b>251</b>
	<b>Index</b> .....	<b>253</b>