
Contents

1	Introduction	1
1.1	The Python Programming Language	2
1.2	Installing Python and Wing IDE 101	3
1.3	Writing Your First Program	7
1.4	What Is a Computer?	8
1.5	Binary Number Representation	10
1.6	What Is a Programming Language?	13
1.7	Hexadecimal and Octal Representation	15
1.8	Writing Your Second Program	17
1.9	Syntax Errors	18
1.10	Types of Values	20
1.11	The Reference Type and Assignment Statements	20
1.12	Integers and Real Numbers	22
1.13	Strings	24
1.14	Integer to String Conversion and Back Again	25
1.15	Getting Input	26
1.16	Formatting Output	27
1.17	When Things Go Wrong	30
1.18	Review Questions	33
1.19	Exercises	33
1.20	Solutions to Practice Problems	36
2	Decision Making	39
2.1	Finding the Max of Three Integers	43
2.2	The Guess and Check Pattern	45
2.3	Choosing from a List of Alternatives	46
2.4	The Boolean Type	48
2.5	Short Circuit Logic	51
2.6	Comparing Floats for Equality	51
2.7	Exception Handling	52
2.8	Review Questions	54
2.9	Exercises	55
2.10	Solutions to Practice Problems	58

3	Repetitive Tasks	63
3.1	Operators	65
3.2	Iterating Over a Sequence	67
3.3	Lists	69
3.4	The Guess and Check Pattern for Lists	72
3.5	Mutability of Lists	74
3.6	The Accumulator Pattern	77
3.7	Reading from and Writing to a File	78
3.8	Reading Records from a File	80
3.9	Review Questions	83
3.10	Exercises	84
3.11	Solutions to Practice Problems	86
4	Using Objects	91
4.1	Constructors	95
4.2	Accessor Methods	96
4.3	Mutator Methods	96
4.4	Immutable Classes	98
4.5	Object-Oriented Programming	98
4.6	Working with XML Files	99
4.7	Extracting Elements from an XML File	101
4.8	XML Attributes and Dictionaries	102
4.9	Reading an XML File and Building Parallel Lists	103
4.10	Using Parallel Lists to Draw a Picture	105
4.11	Review Questions	107
4.12	Exercises	107
4.13	Solutions to Practice Problems	110
5	Defining Functions	115
5.1	Why Write Functions?	116
5.2	Passing Arguments and Returning a Value	117
5.3	Scope of Variables	118
5.4	The Run-Time Stack	122
5.5	Mutable Data and Functions	125
5.6	Predicate Functions	126
5.7	Top-Down Design	128
5.8	Bottom-Up Design	129
5.9	Recursive Functions	129
5.10	The Main Function	131
5.11	Keyword Arguments	134
5.12	Default Values	134
5.13	Functions with Variable Number of Parameters	135
5.14	Dictionary Parameter Passing	136

5.15	Review Questions	137
5.16	Exercises	137
5.17	Solutions to Practice Problems	140
6	Event-Driven Programming	145
6.1	The Root Window	146
6.2	Menus	147
6.3	Frames	148
6.4	The Text Widget	149
6.5	The Button Widget	149
6.6	Creating a Reminder!	151
6.7	Finishing up the Reminder! Application.	152
6.8	Label and Entry Widgets	153
6.9	Layout Management	155
6.10	Message Boxes.	156
6.11	Review Questions	157
6.12	Exercises	157
6.13	Solutions to Practice Problems	160
7	Defining Classes	163
7.1	Creating an Object	164
7.2	Inheritance	169
7.3	A Bouncing Ball Example	174
7.4	Polymorphism	176
7.5	Getting Hooked on Python.	177
7.6	Review Questions	180
7.7	Exercises	180
7.8	Solutions to Practice Problems	186
8	Appendix A: Integer Operators	189
9	Appendix B: Float Operators	191
10	Appendix C: String Operators and Methods	193
11	Appendix D: List Operators and Methods	197
12	Appendix E: Dictionary Operators and Methods	199
13	Appendix F: Turtle Methods	201

14	Appendix G: TurtleScreen Methods.	213
15	Appendix H: The Reminder! Program.	221
16	Appendix I: The Bouncing Ball Program.	225
	Glossary	229
	References.	235
	Index	237

<http://www.springer.com/978-1-4471-6641-2>

Python Programming Fundamentals

Lee, K.D.

2014, XII, 239 p. 64 illus., 53 illus. in color., Softcover

ISBN: 978-1-4471-6641-2