

Contents

Preface — V

Authors' Biography — XV

1	Introduction of Python — 1
1.1	Why Python — 1
1.1.1	Drawbacks of Python — 1
1.2	History of Python — 2
1.3	Major features of Python — 2
1.3.1	What is new in upcoming Python 3.8 — 3
1.4	Market demand — 7
1.5	Why Python in mobile app development? — 9
1.6	Python versions — 11
1.7	Architecture of python application — 11
1.8	System requirement — 13
1.9	Installation of python in various platform — 13
	Installation in windows — 13
	Installation in Linux — 13
	Installation in Mac — 14
1.10	Creating First Hello World app — 14
1.10.1	Basic operations in python prompt — 17
1.11	Anatomy of Python program — 17
1.12	IDLE — 18
1.13	User input — 18
1.14	Installing external modules using pip — 18
	Summary — 19
	Key terms — 20
	Review questions — 20
	Exercise — 21
2	Python basics — 24
2.1	Variables — 24
2.2	Data types — 26
2.2.1	Booleans — 28
2.2.2	Integer — 28
2.2.3	Float — 28
2.2.4	String — 28
2.2.5	None — 29
2.3	Block indentation — 29
2.4	Math calculations — 30

2.5	Operators —	31
2.6	String operations —	31
2.7	Indexing —	32
2.8	Slicing —	33
2.9	Concatenation —	33
2.10	Single-line and multiline comments —	33
2.11	Functions —	34
2.11.1	Built-in functions —	34
2.11.2	User-defined functions —	35
2.11.3	Function with argument —	36
2.11.4	Flow of execution —	36
2.11.5	Default values —	36
2.12	Return value —	37
2.13	Type-casting —	38
2.14	Disassembler —	38
2.15	Lambda keyword —	39
	Summary —	40
	Key terms —	40
	Review questions —	41
	Exercise —	41
3	Conditions and loops —	45
3.1	If and else and conditional statements —	45
3.1.1	Nested if-else —	47
3.2	Loops —	48
3.2.1	For loop —	48
3.2.2	While loop —	49
3.3	Break and continue statement —	49
3.4	Collections —	50
3.4.1	Tuples —	51
3.4.2	Lists —	52
3.4.3	Sets —	54
3.4.4	Frozen sets —	55
3.4.5	Byte —	56
3.4.6	Byte array —	56
3.4.7	String —	57
3.4.8	Dictionaries —	58
3.4.9	Arrays —	60
3.5	Date and time —	61
	Summary —	61
	Key terms —	62

- Review questions — 62
- Exercise — 62

- 4 Object-oriented programming (OOP) — 65**
 - 4.1 Object-oriented programming (OOP) — 65
 - 4.2 Class — 65
 - 4.3 Object — 66
 - 4.4 Functions — 66
 - 4.5 Abstraction — 68
 - 4.5.1 Abstract class — 69
 - 4.5.2 Interface — 70
 - 4.6 Polymorphism — 73
 - 4.6.1 Overloading — 75
 - 4.6.2 Overriding — 76
 - 4.7 Encapsulation — 78
 - 4.8 Inheritance — 79
 - 4.9 Access modifier/specifier — 80
 - 4.10 Decorator — 81
 - 4.10.1 @classmethod decorator — 82
 - 4.10.2 @staticmethod decorator — 83
 - Summary — 83
 - Key terms — 84
 - Review questions — 84
 - Exercise — 85

- 5 Standard libraries — 88**
 - 5.1 File operations using native — 88
 - 5.1.1 Writing file — 89
 - 5.2 OS module — 89
 - 5.3 Exception handling — 91
 - 5.3.1 User-defined exceptions — 92
 - 5.4 Import standard Python modules and packages — 92
 - 5.4.1 Creating a module — 93
 - 5.4.2 Packages — 93
 - 5.5 Regular expression — 95
 - 5.6 Math module — 97
 - 5.6.1 Writing documentation for module — 98
 - 5.7 JSON — 99
 - 5.8 SQLite3 — 101
 - 5.9 SQLAlchemy — 103
 - Summary — 104
 - Key terms — 104

Review questions — 105

Exercise — 106

6 Getting started with Kivy — 109

6.1 Why cross-platform? — 109

6.2 What is Kivy — 109

6.3 Why Python in mobile app — 109

6.4 Kivy architecture — 110

6.5 Python developed mobile apps — 113

6.6 History of Kivy — 114

6.7 Why not Cordova — 114

6.8 Kivy versions — 114

6.9 How it is different from the cross-platform app framework — 114

6.10 System requirement — 115

6.11 Installation of Kivy — 115

6.11.1 Installation in Windows? — 115

6.11.2 Installation in Mac OS? — 115

6.11.3 Installation in Linux? — 116

6.11.4 What are Wheels and pip? — 117

6.11.5 Cython installation in Linux? — 118

6.11.6 Verifying installation — 118

6.12 Creating the First Hello World App — 118

6.12.1 Event handling in Kivy — 119

6.12.2 Event dispatcher — 119

6.12.3 Main loop — 119

6.12.4 Custom events — 120

6.13 Anatomy of Kivy — 121

6.13.1 Running Kivy application — 122

6.13.2 Listing and uninstalling Kivy — 124

Summary — 125

Key terms — 126

Review questions — 126

Exercise — 127

7 Kivy basics — 130

7.1 Configuring environment — 130

7.2 Configure Kivy and how to import Kivy library — 140

7.3 First app — 142

7.3.1 Widgets — 145

7.3.2 Custom widgets — 146

7.4 Orientation horizontal and vertical — 147

7.4.1 size-hint, pos_hint — 149

- 7.4.2 pos_hint — 152
- 7.4.3 FileChooser — 154
- 7.5 super, padding, __init__, add_widget — 158
- 7.5.1 Super — 158
- 7.5.2 __init__ — 159
- 7.5.3 add_widget — 161
 - Summary — 162
 - Key terms — 163
 - Review questions — 163
 - Exercise — 164

- 8 Layouts — 167**
 - 8.1 What is the layout — 167
 - 8.2 Box layout — 167
 - 8.3 Float layout — 170
 - 8.4 Anchor layout — 175
 - 8.5 Grid layout — 178
 - 8.6 Relative layout — 181
 - 8.7 Stack layout — 182
 - 8.8 Page layout — 184
 - Summary — 186
 - Key terms — 186
 - Review questions — 186
 - Exercise — 187

- 9 Designing user interfaces — 190**
 - 9.1 What is UI (user interface) components — 190
 - 9.2 Buttons — 190
 - 9.3 Labels — 193
 - 9.4 ListView — 196
 - 9.4.1 RecyclerView — 197
 - 9.5 Image — 201
 - 9.6 Events and properties — 202
 - 9.7 Fonts and their properties — 204
 - 9.8 Popup menu — 204
 - 9.9 TextInput — 206
 - 9.10 ScrollView — 207
 - 9.11 Kivy clock — 208
 - Summary — 209
 - Key terms — 210
 - Review questions — 210
 - Exercise — 210

10	UX widgets — 213
10.1	ActionBar and slider — 213
10.2	Checkbox and text on window — 215
10.2.1	Toggle button — 219
10.2.2	TreeView — 222
10.3	Radio/checkbox button and label management — 224
10.4	ProgressBar and carousel — 228
	Kivy clock — 230
10.4.1	Custom ProgressBar — 231
10.4.2	Carousel layout — 234
10.4.3	Scatter — 237
10.5	Canvas — 239
10.6	AsyncImage — 241
10.7	Spinner — 243
10.8	Accordion — 244
10.9	Switching between two screens — 245
	Summary — 247
	Key terms — 249
	Review questions — 250
	Exercise — 250
11	Graphics handling — 253
11.1	Graphics — 253
11.2	Interacting with another framework — 256
11.3	Modules — 260
11.4	Network support — 261
11.5	Storage tool — 262
11.6	Rotate clock and rotate speed — 264
11.7	Triggered events — 266
11.8	Animations — 268
11.9	Audio — 270
11.10	Video — 271
	Annotation — 276
	Summary — 276
	Key terms — 278
	Review questions — 279
	Exercise — 279
12	Packaging app for various platforms — 282
12.1	Adding behavior with mixin class — 282
12.1.1	Packaging application — 284
12.1.2	Testing application with android device — 285

- 12.1.3 Packaging for android — 291
- 12.1.4 Plyer — 303
- 12.2 Building an android APK on OS X — 304
- 12.3 Package licensing — 305
- 12.4 Packaging application using Kivy launcher — 305
- 12.5 External libraries — 306
- 12.6 Python application testing — 306
- 12.7 Release on the market — 311
- 12.8 Kivy application testing — 311
 - Summary — 311
 - Key terms — 313
 - Review questions — 314
 - Exercise — 314

- 13 Sample project — 318**
 - 13.1 Introduction of git — 318
 - 13.2 Implementation of git — 318
 - 13.3 Sample project 1 — 320
 - Sample project 2 — 324
 - 13.4 Kivy catalog — 327
 - 13.5 Creating my own screen — 335
 - 13.6 Project game — 336

Bibliography — 341

Index — 343