

CONTENTS

Acknowledgments	xv	
Introduction	xvii	
1	Introduction	1
	What Is the Raspberry Pi?	1
	What Can You Do with a Raspberry Pi?	3
	A Tour of the Raspberry Pi	3
	Setting Up Your Raspberry Pi	5
	Buying What You Need	5
	Connecting Everything Together	11
	Booting Up	12
	Summary	13
2	Getting Started	15
	Linux	15
	The Desktop	16
	The Internet	18
	The Command Line	19
	Navigating with the Terminal	19
	sudo	21
	Applications	22
	Internet Resources	23
	Summary	24
3	Python Basics	25
	IDLE	25
	Python Versions	26
	Python Shell	26
	Editor	27
	Numbers	29
	Variables	30
	For Loops	31
	Simulating Dice	32

If	34
Comparisons	35
Being Logical	36
Else	37
While	38
Summary	39
4 Strings, Lists, and Dictionaries	41
String Theory	41
Lists	43
Functions	46
Hangman	48
Dictionaries	55
Tuples	56
Multiple Assignment	57
Multiple Return Values	57
Exceptions	58
Summary of Functions	58
Numbers	58
Strings	59
Lists	61
Dictionaries	61
Type Conversions	62
Summary	63
5 Modules, Classes, and Methods	65
Modules	65
Using Modules	66
Useful Python Libraries	67
Installing New Modules	67
Object Orientation	69
Defining Classes	69
Inheritance	71
Summary	74
6 Files and the Internet	75
Files	75
Reading Files	75

	Reading Big Files	77
	Writing Files	78
	The File System	79
	Pickling	80
	Internet	81
	Summary	83
7	Graphical User Interfaces	85
	Tkinter	85
	Hello World	85
	Temperature Converter	86
	Other GUI Widgets	90
	Checkbutton	91
	Listbox	91
	Spinbox	92
	Layouts	92
	Scrollbar	96
	Dialogs	97
	Color Chooser	98
	File Chooser	99
	Menus	99
	The Canvas	100
	Summary	101
8	Games Programming	103
	What Is Pygame?	103
	Hello Pygame	104
	A Raspberry Game	106
	Following the Mouse	106
	One Raspberry	108
	Catch Detection and Scoring	109
	Timing	110
	Lots of Raspberries	111
	Summary	114
9	Interfacing Hardware	115
	GPIO Pin Connections	115
	Direct Connection to GPIO Pins	117

Expansion Boards	117
Pi Face	117
Slice of PI/O	119
RaspiRobotBoard	120
Gertboard	121
Prototyping Boards	122
Pi Cobbler	122
Pi Plate	122
Humble Pi	123
Arduino and the Pi	124
Arduino and Pi Talk	125
Summary	128
10 Prototyping Project (Clock)	129
What You Need	130
Hardware Assembly	130
Software	132
Phase Two	134
Summary	137
11 The RaspiRobot	139
What You Need	140
Phase 1: A Basic Rover	141
Hardware Assembly	141
About the Software	145
Phase 2: Adding a Range Finder and Screen	147
Step 1: Assemble the Range Finder Serial Adapter	147
Step 2: Attach the Screen	147
Step 3: Update the Software	149
Step 4: Run It	150
Revised Software	150
Summary	152
12 What Next	153
Linux Resources	153
Python Resources	153
Raspberry Pi Resources	154
Other Programming Languages	155

Scratch	155
C	155
Applications and Projects	157
Media Center (Rasbmc)	157
Home Automation	158
Summary	158
Index	159