

Foreword.....	xi
Preface.....	xiii

Part I. AI2 Tutorials

1. HelloPurr.....	1
What You'll Learn	1
The App Inventor Environment	2
Designing the Components	3
Live Testing	8
Adding Behaviors to the Components	10
Downloading the App to Your Android Device	16
Sharing the App	17
Variations	17
Summary	18
2. PaintPot.....	19
What You'll Learn	20
Getting Started	20
Designing the Components	20
Adding Behaviors to the Components	25
The Complete App: PaintPot	35
Variations	36
Summary	36
3. MoleMash.....	37
What You'll Build	37

What You'll Learn	37
Getting Started	38
Designing the Components	38
Adding Behaviors to the Components	42
The Complete App: MoleMash	48
Variations	49
Summary	49
4. No Texting While Driving.....	51
What You'll Learn	52
Getting Started	52
Designing the Components	53
Adding Behaviors to the Components	54
The Complete App: No Texting While Driving	64
Variations	65
Summary	66
5. Ladybug Chase.....	67
What You'll Build	67
What You'll Learn	67
Designing the Components	68
Adding Behaviors to the Components	71
The Complete App: Ladybug Chase	83
Variations	84
Summary	85
6. Paris Map Tour.....	87
What You'll Learn	87
Designing the Components	88
Setting the Properties of ActivityStarter	88
Adding Behaviors to the Components	89
The Complete App: Map Tour with Activity Starter	93
The Complete App: Map Tour (Web Viewer)	96
Variations	96

What You'll Learn	37
Getting Started	38
Designing the Components	38
Adding Behaviors to the Components	42
The Complete App: MoleMash	48
Variations	49
Summary	49
4. No Texting While Driving.....	51
What You'll Learn	52
Getting Started	52
Designing the Components	53
Adding Behaviors to the Components	54
The Complete App: No Texting While Driving	64
Variations	65
Summary	66
5. Ladybug Chase.....	67
What You'll Build	67
What You'll Learn	67
Designing the Components	68
Adding Behaviors to the Components	71
The Complete App: Ladybug Chase	83
Variations	84
Summary	85
6. Paris Map Tour.....	87
What You'll Learn	87
Designing the Components	88
Setting the Properties of ActivityStarter	88
Adding Behaviors to the Components	89
The Complete App: Map Tour with Activity Starter	93
The Complete App: Map Tour (Web Viewer)	96
Variations	96

Summary	97
7. Android, Where's My Car?.....	99
What You'll Learn	99
Getting Started	99
Designing the Components	100
Adding Behaviors to the Components	102
The Complete App: Android, Where's My Car?	111
Variations	112
Summary	112
8. Presidents Quiz.....	113
What You'll Learn	113
Getting Started	114
Designing the Components	114
Adding Behaviors to the Components	115
The Complete App: The Presidents Quiz	127
Variations	128
Summary	129
9. Xylophone.....	131
What You'll Build	131
What You'll Learn	131
Getting Started	132
Designing the Components	132
Creating the Keyboard	133
Recording and Playing Back Notes	138
The Complete App: Xylophone	144
Variations	145
Summary	146
10. MakeQuiz and TakeQuiz.....	147
What You'll Learn	148
Getting Started	148
Designing the Components	148
Adding Behaviors to the Components	150

The Complete App: MakeQuiz	158
TakeQuiz: An App for Taking the Quiz in the Database	158
The Complete App: TakeQuiz	161
Variations	162
Summary	163
11. Broadcast Hub	165
What You'll Learn	166
Getting Started	166
Designing the Components	166
Adding Behaviors to the Components	168
The Complete App: Broadcast Hub	179
Variations	181
Summary	181
12. Robot Remote	183
What You'll Learn	183
Getting Started	184
Designing the Components	184
Adding Behaviors to the Components	187
Driving the NXT	192
Using the Ultrasonic Sensor to Detect Obstacles	194
Variations	196
Summary	197
13. Amazon at the Bookstore	199
What You'll Learn	199
What is an API?	200
Getting Started	202
Designing the Components	202
Programming the App's Behavior	204
The Complete App: Amazon at the Bookstore	210
Customizing the API	211
Variations	211

Part II. Inventor's Manual

14. Understanding an App's Architecture.....	215
Components	216
Behavior	216
An App as a Recipe	216
An App as a Set of Event Handlers	217
Event Types	219
Event Handlers Can Ask Questions	221
Event Handlers Can Repeat Blocks	222
Event Handlers Can Remember Things	223
Event Handlers Can Interact with the Web	223
Summary	224
15. Engineering and Debugging an App.....	225
Software Engineering Principles	225
Solve Real Problems	226
Build a Prototype and Show Users	226
Incremental Development	226
Design Before Coding	227
Comment Your Code	228
Divide, Layer, and Conquer	228
Understand Your Language: Tracking with Pen and Paper	229
Debugging an App	232
Watching Variables	233
Testing Individual Blocks	233
Incremental Development with Do It	234
Disabling Blocks	234
Summary	234
16. Programming Your App's Memory.....	235
Named Memory Slots	235
Properties	235

Defining Variables	236
Setting and Getting a Variable	237
Setting a Variable to an Expression	238
Incrementing a Variable	238
Building Complex Expressions	239
Displaying Variables	240
Local Variables	240
Summary	241
17. Creating Animated Apps.	243
Adding a Canvas Component to Your App	243
The Canvas Coordinate System	243
Animating Objects with Timer Events	245
Creating Movement	246
Speed	247
Collision Detection	247
EdgeReached	247
CollidingWith and NoLongerCollidingWith	248
Interactive Animation	249
Specifying Sprite Animation Without a Clock Timer	250
Summary	252
18. Programming Your App to Make Decisions: Conditional Blocks.	253
Testing Conditions with if and else if Blocks	254
Programming an Either/Or Decision	255
Programming Conditions Within Conditions	255
Programming Complex Conditions	256
Summary	260
19. Programming Lists of Data.	261
Creating a List Variable	261
Selecting an Item in a List	262
Using an Index to Traverse a List	262
Example: Traversing a List of Paint Colors	262
Creating Input Forms and Dynamic Data	263

Defining a Dynamic List	265
Adding an Item	266
Displaying a List	266
Removing an Item from a List	267
Lists of Lists	269
Summary	271
20. Repeating Blocks.	273
Controlling an App's Execution: Branching and Looping	273
Iterating Functions on a List with for each	274
A Closer Look at Looping	275
Writing Maintainable Code	276
Using for each to Display a List	276
The while-do Block	278
Using while-do to Compute a Formula	279
Summary	280
21. Defining Procedures and Reusing Blocks.	281
Eliminating Redundancy	283
Defining a Procedure	284
Calling a Procedure	284
The Program Counter	285
Adding Parameters to Your Procedure	286
Returning Values from a Procedure	288
Reusing Blocks Among Apps	290
The distanceBetweenPoints Procedure	290
Summary	293
22. Working with Databases.	295
Storing Persistent Data in TinyDB	296
Retrieving Data from TinyDB	297
Shared Data and TinyWebDB	297
Requesting Data with Various Tags	304
Setting Up a Web Database	306

Summary	306
23. Reading and Responding to Sensors.....	307
Creating Location-Aware Apps	307
Using the Orientation Sensor	311
Using the Accelerometer	315
Summary	317
24. Communicating with the Web.....	319
The WebViewer Component	321
The Web Component	323
TinyWebDB and TinyWebDB-Compliant APIs	324
Summary	325
Index.....	327