

Beginning iPhone Development

Exploring the iPhone SDK

**DAVE MARK
JEFF LAMARCHE**

Apress®



Beginning iPhone Development: Exploring the iPhone SDK

Copyright © 2009 by Dave Mark, Jeff LaMarche

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without the prior written permission of the copyright owner and the publisher.

ISBN-13 (pbk): 978-1-4302-1626-1

ISBN-10 (pbk): 1-4302-1626-3

Printed and bound in the United States of America 9 8 7 6 5 4 3 2 1

Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, we use the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

Lead Editor: Clay Andres

Technical Reviewer: Mark Dalrymple

Editorial Board: Clay Andres, Steve Anglin, Mark Beckner, Ewan Buckingham, Tony Campbell, Gary Cornell, Jonathan Gennick, Michelle Lowman, Matthew Moodie, Jeffrey Pepper, Frank Pohlmann, Ben Renow-Clarke, Dominic Shakeshaft, Matt Wade, Tom Welsh

Project Manager: Laura Esterman

Copy Editor: Heather Lang

Assistant Production Director: Kari Brooks-Copony

Production Editor: Kelly Winkist

Compositor: Diana Van Winkle

Proofreader: Linda Seifert

Indexer: Broccoli Information Management

Artist: Diana Van Winkle

Cover Designer: Kurt Krames

Manufacturing Director: Tom Debolski

Distributed to the book trade worldwide by Springer-Verlag New York, Inc., 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax 201-348-4505, e-mail orders-ny@springer-sbm.com, or visit <http://www.springeronline.com>.

For information on translations, please contact Apress directly at 2855 Telegraph Avenue, Suite 600, Berkeley, CA 94705. Phone 510-549-5930, fax 510-549-5939, e-mail info@apress.com, or visit <http://www.apress.com>.

Apress and friends of ED books may be purchased in bulk for academic, corporate, or promotional use. eBook versions and licenses are also available for most titles. For more information, reference our Special Bulk Sales—eBook Licensing web page at <http://www.apress.com/info/bulksales>.

The information in this book is distributed on an “as is” basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the author(s) nor Apress shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this work.

The source code for this book is available to readers at <http://www.apress.com>.

Contents

About the Authors	xvii
About the Technical Reviewer	xix
Acknowledgments	xxi
Preface	xxiii

CHAPTER 1 **Welcome to the Jungle..... 1**

What This Book Is	1
What You Need Before You Can Begin.....	2
What You Need to Know Before You Begin	4
What's Different About Coding for iPhone?	5
Only One Running Application	5
Only One Window.....	6
Limited Access.....	6
Limited Response Time.....	6
Limited Screen Size	6
Limited System Resources.....	7
Missing Cocoa Tools.....	7
Some New Stuff.....	7
A Different Approach.....	8
What's in This Book	8
Are You Ready?	10

CHAPTER 2 **Appeasing the Tiki Gods 11**

Setting Up Your Project in Xcode	11
The Xcode Project Window	14
Introducing Interface Builder.....	17
What's in the Nib File?	19
Adding a Label to the View	20
Some iPhone Polish—Finishing Touches.....	23
Ready to Compile and Run	26
Bring It on Home	27

CHAPTER 3	Handling Basic Interaction	29
	The Model-View-Controller Paradigm	30
	Creating Our Project	31
	Creating the View Controller	31
	Outlets	33
	Actions	33
	Adding Actions and Outlets to the View Controller	34
	Adding Actions and Outlets to the Implementation File	37
	Using the Application Delegate	41
	Editing MainWindow.xib	44
	Editing Button_FunViewController.xib	45
	Creating the View in Interface Builder	45
	Connecting Everything	48
	Trying It Out	52
	Bring It on Home	52
CHAPTER 4	More User Interface Fun	53
	A Screen Full of Controls	54
	Active, Static, and Passive Controls	55
	Creating the Application	56
	Importing the Image	56
	Implementing the Image View and Text Fields	57
	Adding the Image View	59
	Adding the Text Fields	63
	Set the Attributes for the Second Text Field	66
	Connecting Outlets	66
	Build and Run	67
	Making the Keyboard Go Away When Done Is Tapped	67
	Touching the Background to Close the Keyboard	69
	Implementing the Slider and Label	70
	Determining Outlets	70
	Determining Actions	71
	Adding Outlets and Actions	71
	Adding the Slider and Label	72
	Connecting the Actions and Outlets	73
	Implementing the Switches and Segmented Control	74
	Determining Outlets	74
	Determining Actions	74

Adding the Switches and Segmented Control	76
Connecting the Outlets	78
Implementing the Button, Action Sheet, and Alert	79
Adding the Outlet and Action to the Controller Header File	79
Adding the Button in Interface Builder	80
Implementing the Button's Action Method	80
Showing an Action Sheet	81
The Action Sheet Delegate and Creating an Alert	83
Spiffing Up the Button	84
The viewDidLoad Method	85
Control States	86
Stretchable Images	86
Crossing the Finish Line	87

CHAPTER 5 **Autorotation and Autosizing** 89

Handling Rotation Using Autosize Attributes	91
Specifying Rotation Support	91
Designing an Interface with Autosize Attributes	93
Autosize Attributes	94
Setting the Buttons' Autosize Attributes	96
Restructuring a View When Rotated	97
Declaring and Connecting Outlets	98
Moving the Buttons on Rotation	99
Swapping Views	102
Determining Outlets	103
Determining Actions	104
Declaring Actions and Outlets	104
Designing the Two Views	105
Implementing the Swap and the Action	106
Linking in the Core Graphics Framework	109
Rotating Out of Here	111

CHAPTER 6 **Multiview Applications** 113

The View Switcher Application	116
The Architecture of a Multiview Application	117
Multiview Controllers Are View Controllers	117
Anatomy of a Content View	117

Building View Switcher	118
Creating Our View Controller and Nib Files	119
Modifying the App Delegate	121
SwitchViewController.h	122
Modifying MainWindow.xib	123
Writing SwitchViewController.m	126
Implementing the Content Views	130
Animating the Transition	132
Refactoring	135
Switching Off	137

CHAPTER 7

Tab Bars and Pickers 139

The Pickers Application	140
Delegates and Datasources	141
Setting Up the Tab Bar Framework	142
Creating the Files	142
Setting Up the Content View Nibs	143
Adding the Root View Controller	144
Implementing the Date Picker	148
Implementing the Single Component Picker	151
Declaring Outlets and Actions	151
Building the View	152
Implementing the Controller As Datasource and Delegate	153
Implementing a Multicomponent Picker	158
Declaring Outlets and Actions	158
Building the View	159
Implementing the Controller	159
Implementing Dependent Components	163
Creating a Simple Game with a Custom Picker	170
Writing the Controller Header File	170
Building the View	171
Adding Image Resources	172
Implementing the Controller	172
The spin Method	175
The viewDidLoad Method	176
Final Details	178
Linking in the Audio Toolbox Framework	182
Final Spin	183

CHAPTER 8	Introduction to Table Views	185
	Table View Basics	186
	Grouped and Indexed Tables	187
	Implementing a Simple Table	189
	Designing the View	189
	Writing the Controller	190
	Adding an Image	194
	Additional Configurations	195
	Setting the Indent Level	195
	Handling Row Selection	196
	Changing Font Size and Row Height	198
	What Else Can the Delegate Do?	199
	Customizing Table View Cells	199
	The Cells Application	200
	Adding Subviews to the Table View Cell	200
	Using a Custom Subclass of UITableViewCell	204
	Grouped and Indexed Sections	209
	Building the View	209
	Importing the Data	209
	Implementing the Controller	210
	Adding an Index	214
	Implementing a Search Bar	215
	Rethinking the Design	215
	A Deep Mutable Copy	216
	Updating the Controller Header File	218
	Modifying the View	220
	Modifying the Controller Implementation	221
	Putting It All on the Table	230
CHAPTER 9	Navigation Controllers and Table Views	231
	Navigation Controllers	232
	Stacky Goodness	232
	A Stack of Controllers	232
	Nav, a Hierarchical Application in Six Parts	233
	Constructing the Nav Application's Skeleton	236
	Creating the Root View Controller	236
	Setting Up the Navigation Controller	236
	Our First Subcontroller: The Disclosure Button View	244

Our Second Subcontroller: The Checklist	252
Our Third Subcontroller: Controls on Table Rows	257
Our Fourth Subcontroller: Moveable Rows	263
Editing Mode	263
Creating a New Second-Level Controller	264
Our Fifth Subcontroller: Deletable Rows	270
Our Sixth Subcontroller: An Editable Detail Pane	276
Creating the Data Model Object	276
Creating the Controllers	278
Creating the Detail View Controller	282
But There's One More Thing... ..	298
Breaking the Tape	301

CHAPTER 10 **Application Settings and User Defaults 303**

Getting to Know Your Settings Bundle	304
The AppSettings Application	305
Creating the Project	306
Working with the Settings Bundle	309
Adding a Settings Bundle to Our Project	309
Setting Up the Property List	310
Adding a Text Field Setting	311
Adding a Secure Text Field Setting	314
Adding a Multivalue Field	314
Adding a Toggle Switch Setting	315
Adding the Slider Setting	316
Adding a Child Settings View	317
Reading Settings in Our Application	319
Changing Defaults from Our Application	323
Beam Me Up, Scotty	327

CHAPTER 11 **Basic Data Persistence 329**

Your Application's Sandbox	330
Getting the Documents Directory	331
Getting the tmp Directory	331
File Saving Strategies	332
Single-File Persistence	332
Multiple-File Persistence	332
Persisting Application Data	333
Property List Serialization	333

The Persistence Application	335
Creating the Persistence Project	335
Designing the Persistence Application View	336
Editing the Persistence Classes	337
Archiving Model Objects	341
Implementing NSCopying	343
The Archiving Application	345
Implementing the FourLines Class	345
Implementing the PersistenceViewController Class	346
Using iPhone's Embedded SQLite3	350
Setting Up a Project to Use SQLite3	352
Persistence Rewarded	359

CHAPTER 12 **Drawing with Quartz and OpenGL** 361

Two Views of a Graphical World	362
This Chapter's Drawing Application	363
The Quartz Approach to Drawing	363
Quartz 2D's Graphics Contexts	363
The Coordinates System	364
Specifying Colors	365
Drawing Images in Context	367
Drawing Shapes: Polygons, Lines, and Curves	368
Quartz 2D Tool Sampler: Patterns, Gradients, and Dash Patterns	368
Building the QuartzFun Application	368
Creating a Random Color	370
Defining Application Constants	371
Implementing the QuartzFunView Skeleton	371
Adding Outlets and Actions to the View Controller	374
Updating QuartzFunViewController.xib	376
Drawing the Line	378
Drawing the Rectangle and Ellipse	380
Drawing the Image	382
Some OpenGL ES Basics	388
Building the GLFun Application	388
Drawing a Blank	400

CHAPTER 13	Taps, Touches, and Gestures.....	401
	Multitouch Terminology.....	402
	The Responder Chain	402
	Forwarding an Event: Keeping the Responder Chain Alive..	403
	The Multitouch Architecture	404
	The Four Gesture Notification Methods	405
	The Touch Explorer Application.....	406
	The Swipes Application	410
	Implementing Multiple Swipes	413
	Detecting Multiple Taps.....	416
	Detecting Pinches	420
	Defining Custom Gestures	424
	The CheckPlease Touch Methods	427
	Garçon? Check, Please!.....	428
CHAPTER 14	Where Am I? Finding Your Way with Core Location	429
	The Location Manager	430
	Setting the Desired Accuracy	430
	Setting the Distance Filter	430
	Starting the Location Manager	431
	Using the Location Manager Wisely	431
	The Location Manager Delegate.....	431
	Getting Location Updates	432
	Getting Latitude and Longitude Using CLLocation	432
	Error Notifications.....	433
	Trying Out Core Location.....	434
	Updating Location Manager.....	438
	Determining Distance Traveled	439
	Wherever You Go, There You Are.....	439
CHAPTER 15	Wheel!	441
	Accelerometer Physics	441
	Accessing the Accelerometer.....	442
	UIAcceleration	443
	Implementing the accelerometer:didAccelerate: Method ..	444
	Shake and Break	447
	The Code That Breaks	448
	Load the Simulation Files.....	451
	All Better—The Healing Touch	452

	The Rolling Marble Program.....	452
	Implementing the Ball View Controller.....	453
	Writing the Ball View	454
	Calculating Ball Movement	458
	Rolling On	461
CHAPTER 16	iPhone Camera and Photo Library	463
	Using the Image Picker and UIImagePickerController.....	464
	Implementing the Image Picker Controller Delegate	465
	Road Testing the Camera and Library	467
	Designing the Interface	468
	Implementing the Camera View Controller.....	468
	It's a Snap!.....	472
CHAPTER 17	Application Localization	473
	Localization Architecture.....	473
	Using String Files	475
	Creating the Strings File	476
	Real-World iPhone: Localizing Your Application	477
	Looking at the Current Locale	480
	Trying Out LocalizeMe.....	481
	Localizing the Nib.....	482
	Looking at the Localized Project Structure	483
	Localizing an Image.....	485
	Localizing the Application Icon	486
	Generating and Localizing a Strings File.....	487
	Auf Wiedersehen	490
CHAPTER 18	Where to Next?.....	491
	Getting Unstuck	491
	Apple's Documentation	492
	Mailing Lists	492
	Discussion Forums	492
	Web Sites.....	493
	Blogs	493
	And If All Else Fails... ..	494
	Farewell	494
INDEX		495