
Index

A

- AbstractRenderer class, 200
- addValidator() method, 124
- Advanced debugging and analysis
 - adb command, 170
 - allocation tracker, 165
 - applications, 154
 - Camera button, 158
 - DDMS perspectives, 156
 - debug button, 157
 - Debug perspective, 154
 - devices view menu, 164
 - dump view hierarchy button, 159
 - Emulator Console, 170
 - features, 154
 - garbage collection, 156
 - Heap button, 157
 - Hierarchy view perspective, 168
 - OpenGL trace dialog, 163
 - skills and test, 167
 - Stop button, 158
 - StrictMode
 - exercise, 173
 - StrictMode policies, 171
 - turn off StrictMode, 172
 - systrace button, 159
 - Threads button, 158
 - Traceview, 165
- Android search
 - action keys
 - keycode, 324
 - list of, 323
 - queryActionMsg, 324
 - suggestActionMsg, 324
 - suggestActionMsgColumn, 325
 - suggestion cursor, 325
 - XML segment, 323–324
 - application-specific search
 - context, 325–327
 - global search (see Global search)
 - search box, 257
 - Search key
 - disabling search, 266
 - local search (see Local search)
 - menu, 267
 - onSearchRequested() method, 267
 - regular activity, 266
 - startSearch method, 267
 - SearchView
 - action bar, 274–275
 - menu item, 275
 - and search results activity, 275–276
 - type-to-search mode, 274
- Android versions
 - compatibility library
 - ActionBar, 111
 - FragmentActivity, 111
 - library jar files, 111
 - onCreateOptionsMenu() code, 112
 - SDK directory, 113
 - XML and Java, 112
 - operating system, 109
 - <uses-sdk> tag
 - API level, 111
 - APK application, 110
 - Build.VERSION_CODES, 111
 - Google Play, 110
 - manifest file, 110
 - SDK versions, 110
- AnimatedSimpleTriangleRenderer class, 202
- aTextureCoordinate attribute, 243

B

Backend As A Service (BaaS), 329
 BaseSavedState protocol, 15
 Bounding volume, 184
 BroadcastReceiver, 137

C

Camera coordinates, 180
 CircleView
 with clicks, 2
 match_parent, 2
 source code
 AbstractBaseView class, 24
 attrs.xml, 30
 implementation, 27
 in linear layout, 30
 state management, 2
 wrap_content, 2
 Color buffer, 178
 Compound controls, 62
 vs. custom views, 33
 duration (see DurationControl)
 view state management
 APIs, 47
 child views, 50
 dispatchRestoreInstanceState, 48
 dispatchSaveInstanceState, 47–48
 extending existing view, 52
 onSaveInstanceState, 47–48
 SavedState class
 implementation, 48
 ViewGroup class, 47
 createFromParcel() method, 359
 Cube renderer, controllable
 spinning cube, 245
 Custom attributes
 attrs.xml, 21
 constructor design, 23
 outside styleable tags, 21
 strokeColor, 20
 strokeWidth, 20
 TypedArrays, 22
 uniqueness, package level, 21
 customdata, 391
 Custom layouts, 63
 compound controls, 62
 custom views, 61

flow layout (see FlowLayout)
 LayoutParams (see LayoutParams)
 Custom views, 61
 attributes (see Custom attributes)
 CircleView (see CircleView)
 drawing
 measurement and layout, 4
 onDraw() (see onDraw() method)
 onDraw mechanics, 5
 View class, 3
 ViewGroup class, 3
 ViewParent class, 3
 ViewRoot class, 3–4
 measure pass
 mode bit, 7
 onMeasure() (see onMeasure() method)
 setMeasuredDimension(), 7
 responding to events, 12–15
 saving view state
 Activity methods, 15
 BaseSavedState pattern, 18
 configuration change, 15
 instance data, 15
 self state management, 17

D

DatePickerFragment class, 42
 constructing, 44
 creation, 42
 onDateSet method, 46
 restoring, 45
 defRadius, 19
 Depth buffer, 178
 dispatchDraw(), 5
 dispatchFreezeSelfOnly, 48
 dispatchRestoreInstanceState, 48
 dispatchSaveInstanceState, 47–48
 divideMessage() method, 137
 done() method, 340
 doSearchQuery() function, 285
 draw() method, 5
 DurationControl, 34, 66
 activity layout, 40
 constructor, 38–39
 custom attributes
 attrs.xml, 51
 initializing, 52
 custom layout file, 38

- date picker fragment dialog, 35
 - callback method, 46
 - constructing, 44
 - DatePickerFragment class creation, 42
 - device rotation, 36
 - fragment manager access, 41
 - invoking, 35, 42
 - restoring, 45
 - saving date, 35
- DatePickerFragment.java, 58
- DurationControl.java, 53
- extending existing layout, 37
- in landscape mode, 36
- /layout/duration_view_layout.xml, 58
- loading custom layout, 39
- Main Activity XML file, 58
- in portrait mode, 37
- /values/attrs.xml, 58

E

- Eclipse Android Developer Tools (ADT), 154
- Eclipse Memory Analyzer (MAT), 157
- EGL, 177
- ES20SingleTextureAbstractRenderer, 240
- examineIntent() method, 389
- Eye coordinates, 180

F

- Field transporters, 366
- findInBackground() method, 349
- FlowLayout
 - attrs.xml, 65
 - onLayout() method, 66, 69
 - onMeasure() method
 - FlowLayout.LayoutParams, 69
 - implementing, 67
 - LayoutParams object, 69
 - measureChild() method, 65
 - MeasureSpec, 67
 - measuring algorithm, 66
 - resolveSize() method, 66
 - ViewGroup.measureChild() method, 65, 77
 - planning, 63
 - source code, 72
 - activity, 76
 - ViewGroup.getChildMeasureSpec, 77
 - from ViewGroup class, 64

- forceLayout() method, 13–15
- FormActivity class
 - addValidator() method, 124
 - Field class, 124–126
 - initializeFormFields(), 123
 - IValidator, 125
 - IValueValidator, 124
 - PasswordRule, 127
 - pseudocode, 126
 - regular expressions, 127–128
 - responsibility, 122
 - source code, 122–123
 - template method, 124
 - value validator, 124
- Form processing
 - Android SDK, 115
 - BaseActivity design
 - activity levels, 119
 - source code, 120–121
 - String-based methods, 121–122
 - creation, 132
 - FormActivity class
 - addValidator() method, 124
 - Field class, 124–126
 - initializeFormFields(), 123
 - IValidator, 125
 - IValueValidator, 124
 - PasswordRule, 127
 - pseudocode, 126
 - regular expressions, 127–128
 - responsibility, 122
 - source code, 122–123
 - template method, 124
 - value validator, 124
 - planning
 - field validation, 116–117
 - filled-in form, 117
 - multi-field validation, 118
 - signup form, 116
 - success activity, 118
 - SignupActivityTestForm
 - gotoActivity(), 131
 - input types, 131
 - layout file, 130
 - source code, 128, 130
 - validateForm() method, 131
 - steps, 115
 - validation framework, 119

Fragment, 176
 Fragment shaders, 177, 179, 219, 224
 Frame buffer, 178

G

garbage collection (GC), 156
 getFieldList(), 365
 getPreferences() method, 87
 glActiveTexture, 212
 glBindTexture, 210
 GL_BLEND, 212
 glClear method, 187
 glColor method, 187
 glDrawElements method, 185
 GLEW, 177
 glFrustum and viewing volume, 190
 glGenTextures, 210
 glMatrixMode(), 202
 Global search

- activity/dialog menu, 263–264
- dialog, 258–260
- Go button, 262
- left-side search context/application icon, 262
- pencil icon, 262
- quick search box (QSB)/search widget, 258, 262
- searchable applications, 265
- search arrow, 262
- Search key, 259–260
- search suggestions, 261–263
- settings, 263
- suggestion providers, 262
- suggestions cursor, 262
- zero suggestions mode, 261

 GLSL, 179
 GLSurfaceView

- drawing steps, 192
- OpenGL ES 2.0, 221
- OpenGLTestHarness activity, 196
- OpenGL triangle, 197–198
- and Renderer interface
 - (see Renderer interface)

 glTexEnv, 211
 glTexParameter, 211
 gluLookAt and camera symbolism

- eye point, 188
- up vector orientation, 189

viewing concepts, 189
 view point, 189
 world coordinates, 188
 GLUT, 177
 GLUtils.texImage2D, 212
 glVertexPointer method, 184
 glViewport and screen size, 191
 Google Voice, 148
 GSON

- features, 83
- jar file, 83
- Java library, 83
- Java objects
 - behavior, 85
 - child object, 85
 - conversion, 86
 - root object, 84
- saving/restoring objects, 90

H

Hardware features

- <compatible-screens> and <supports-screens> tags, 108
- <uses-feature> tags, 107

 Heap and CPU Profiling Agent (HPROF) file, 156
 heightMeasureSpec argument, 4

I

initializeFormFields() method, 123
 Intent.ACTION_VIEW, 148
 invalidate() method, 6

J, K

JavaScript Object Notation (JSON)

- Android, data storage, 82
- approach, 81
- external storage, 95
- Google Projects, 81
- GSON (see GSON)
- internal storage
 - file location, 95
 - file stream, 92
 - file utility methods, 94–95
 - storing/retrieving, 93–94
 - string, 95
 - XML file, 92

- shared preference
 - Android SDK, 87
 - application context, 87
 - save and restore strings, 88
 - XML file, 87
- SQLite, 96
- strings, 83

L

- layout() method, 5
- LayoutParams
 - construction, 71
 - definition, 70
 - spacing variable, 70
- Layouts
 - ADT version, 107
 - Android, 105
 - dimens.xml, 107
 - directory, 106
 - dps, 106
 - landscape layout, 106
 - qualifier, 106
 - resource file, 105
 - smartphone, 105
 - tablet vs. phone, 105
- LinearLayout, 37, 39
- Local search, 259
 - components interaction, 269
 - invoking activity, 268–269
 - SearchableInfo file, 268
 - search dialog, 268
 - search results activity, 268–269
 - layout file, 270
 - LocalSearchEnabledActivity, 271–272
 - manifest file, 270
 - metadata, 272
 - quick search box (QSB), 273–274
 - searchableInfo, 271
 - source code, 270
- Look-at point, 189

M, N

- measureChild() method, 65
- measure() method, 4
- MenuItemCompat.setShowAsAction()
 - method, 112

- Model coordinates, 180
- Model view projection (MVP) matrix, 181
- Multiple devices
 - Android versions (see Android versions)
 - hardware features
 - <compatible-screens> and <supports-screens> tags, 108
 - <uses-feature> tags, 107
 - qualifiers, 107
 - screen density
 - dimensions, 102
 - mapping views, 101
 - pixels, 100
 - resource directory, 102
 - scaling factors, 101
 - terms and meaning, 99
 - screen sizes
 - buckets, 104
 - graphic image file, 103
 - layouts (see Layouts)

O

- Object coordinates, 179
- onActivityCreated() method, 34, 45
- onClick method, 13
- onCreate() method, 286, 389
- onDraw() method, 6, 11, 168
- onLayout() method, 6, 66, 69
- onMeasure() method, 4, 6
 - custom views
 - android:layout_height argument, 8
 - getImprovedDefaultHeight(), 8–9
 - getImprovedDefaultWidth(), 8–9
 - getSuggestedMinimumHeight(), 10
 - implementation, 9–10
 - layout sizes, 8
 - mode bit, 7
 - override, 7
 - responsibility of, 7
 - setMeasuredDimension, 9
 - UNSPECIFIED mode, 10
 - widthMeasureSpec, 8
 - wrap_content, 10–11
- FlowLayout
 - FlowLayout.LayoutParams, 69
 - implementing, 67
 - LayoutParams object, 69

- onMeasure() method (*cont.*)
 - measureChild() method, 65
 - measurespec, 67
 - measuring algorithm, 66
 - resolveSize() method, 66
 - ViewGroup.measureChild() method, 65, 77
- onNewIntent() method, 389
- onPause(), 139
- onRestoreInstanceState, 48, 50
- onResume(), 139
- onSaveInstanceState, 47
- onSaveInstanceState, 50
- onSizeChanged() method, 5, 7
- OpenGL
 - anti-aliasing, 182
 - APIs, 176
 - blending, 182
 - camera and eye coordinates, 180
 - client server model, 176
 - color buffer, 178
 - color sum, 183
 - depth buffer, 178
 - device coordinates, 181
 - dithering, 183
 - 3D picture on 2D screen, 188
 - EGL, 177
 - ES 3D graphics API (see OpenGL ES)
 - fog effect, 183
 - fragment, 176
 - fragment testing, 183
 - frame buffer, 178
 - frustum coordinates, 181
 - GLEW, 177
 - glFrustum controls (see glFrustum and viewing volume)
 - GLSL and shaders, 179
 - gluLookAt controls (see gluLookAt and camera symbolism)
 - GLUT, 177
 - glViewport controls (see glViewport and screen size)
 - model coordinates, 180
 - model view projection matrix, 181
 - multiple figures
 - glDrawElements, 217
 - glDraw methods, 215
 - pair of textured circles, 218–219
 - pair of textured polygons, 218
 - textured polygon renderer, 216
 - object coordinates, 179
 - pixel, 177
 - renderscript, 178
 - shapes (see Regular polygon shapes)
 - stencil buffer, 178
 - textures
 - abstracting single texture, 208
 - behavior, 211
 - bitmap, 207
 - Bitmap loading, 212
 - blending, 211
 - drawing, 213
 - name, 208, 210
 - normalized coordinates, 207
 - SingleAbstractTextureRenderer class, 208
 - target, 210
 - unit, 212
 - vertex, 176
 - attributes, 182
 - winding, 182
 - view port and window/screen coordinates, 181
 - world coordinates, 180
- OpenGL ES
 - interfacing with Android
 - another triangle indices, 200
 - changing camera settings, 198
 - GLSurfaceView (see GLSurfaceView)
 - OpenGL triangle animation, 201
 - 1.0 version (see OpenGL ES 1.0)
 - 2.0 version (see OpenGL ES 2.0)
- OpenGL ES 1.0
 - glClear, 187
 - glColor, 187
 - glDrawElements, 185
 - glVertexPointer, 184
 - primitive shapes, 183
- OpenGL ES 2.0
 - GLSL, 219
 - java bindings, 221
 - pipeline, 220
 - rendering steps, 222
 - shaders
 - access, 228
 - compilation, 225
 - fragment, 224
 - vertex, 223

- spinning textured cube
 - fragment coder with 2D
 - texture sampling, 244
 - renderer (see Cube renderer)
 - single textured abstract renderer, 240
 - vertex shader with
 - texture coordinates, 243
- triangle, ES20AbstractRenderer, 228
- Orthographic projection, 191

P

ParcelableFileDescriptor, 359

Parse

- contents and file descriptors, 358
- Create Meaning button, 376
- create word meaning, 355
- meanings activity, 355
- ParseObjectWrapper, 369
 - field transporters, 366
 - source code, 360
 - Word based parceling, 372
 - writeToParcel() method, 364
- ParseWrapperObject, 356
- reading and writing members, 359
- User class, 357–358
- WordMeaningsListActivity
 - passing word, intent extra, 373
 - source code, 374
 - typed word retrieving, 374
- words activity, 354
- write time parcelable flags, 359
- Parse cloud storage
 - Android application
 - application keys, 337
 - initialization, 338
 - ParseApplication.java, 338
 - Parse Starter, 337
- BAAS platform, 329–330
- Base ParseObject, 335
- implementation
 - login, 341
 - log in/not, 340
 - logout method, 341
 - ParseObjectWrapper class, 344–345
 - ParseQuery object, 348
 - Psuedocode, 344
 - reset password, 342

- signup activity, 339
- typed object word, 346
- Typeless Parse object, 344
- user query, 343
- Word class, 347
- Word Parse object, 347
- ParseQuery object, 336
- ParseUser object, 336
- planning
 - data object, 334
 - homepage application, 333
 - list activity, 334
 - login activity, 331
 - reset password, 332
 - signup, 331
 - user-management features, 330
 - users activity, 334
- Parse.initialize(), 388
- ParseObjectEssentials, 369
- Parse push notifications
 - broadcast receiver, 393
 - action attribute, JSON object, 393
 - invoke, 392
 - TestBroadcastReceiver registering, 394
 - TestBroadcastReceiver source code, 393
- installation object, 386, 388
- initializing application, 387
- JSON data, 391
- ParseBroadcastReceiver, 388
- permissions, 388
- PushService class, 387–388
- responding and sending
 - push notifications, 389
- RespondToPushActivity, 382
- sending message
 - as data, 390
 - on particular channel, 390
 - through client program, 390
- supporting screens
 - on Android device, 385–386
 - push message construction, 384–385
 - server-side Parse dashboard, 383–384
- user, 383
- user-defined channel, 387
- Welcome screen, 382
- ParsePush object, 390
- ParsePush.setMessage() method, 391
- Perspective projection, 191

Pixel, 177
 Primitive shapes, 183
 Protocol Description Unit (PDU), 142
 Push channels, 383

Q

queryAfterZeroResults attribute, 311

R

Real-time Streaming Protocol (RTSP), 149
 Real-time Transport Protocol (RTP), 149
 RegularPolygon shape
 animation, 204
 implementation, 204
 object, 203
 shape interface, 204
 RelativeLayout, 37
 Renderer interface
 AbstractRenderer.java, 193
 nio buffers, 196
 onDrawFrame() method, 193
 onSurfaceChanged() method, 193
 onSurfaceCreated() method, 193
 signature, 193
 SimpleTriangleRenderer, 194
 Renderscript, 178
 requestLayout() method, 4, 6
 vs. forceLayout() method, 13–15
 and invalidate() method, 12–13
 onSizeChanged(), 13
 resolveSize() method, 66
 RespondToPushActivity class, 382, 388

S

SavedState class, 19, 48
 saveEventually(), 388
 saveInBackground(), 388
 Screen density
 dimensions, 102
 mapping views, 101
 pixels, 100
 resource directory, 102
 scaling factors, 101
 terms and meaning, 99
 SearchActivity, 316
 SearchSuggestAction attribute, 310–311

searchSuggestIntentData attribute, 311
 searchSuggestPath attribute, 311
 searchSuggestThreshold attribute, 311
 SecurityException, 148
 sendMessage() method, 390
 sendMultipartTextMessage() method, 137, 140
 sendTextMessage() method, 137
 Session Description Protocol (SDP), 149, 151
 Session Initiation Protocol (SIP)
 android.permission.
 ACCESS_WIFI_STATE, 151
 android.permission.INTERNET
 permission, 151
 android.permission.RECORD_AUDIO
 permission, 151
 android.permission.USE_SIP
 permission, 151
 android.permission.WAKE_LOCK, 151
 client computer programs, 149
 Google Voice, 148
 IETF standard, 148
 RTP, 149
 RTSP, 149
 SDP, 149, 151
 SipAudioCall class, 151
 SipDemo, 149
 SipManager class, 150
 SipProfile class, 150
 SipSession class, 150
 Skype, 148
 soft phones, 149
 VoIP, 148
 setData() method, 390
 Shaders, 219
 access, 228
 compilation, 225
 fragment, 224
 vertex, 223
 Short Message Service (SMS)
 folders
 draft, 144
 inbox, 142
 list, 144
 sent, 144
 monitoring messages
 android.content.BroadcastReceiver
 class, 140
 AndroidManifest.xml file, 140

- android.permission.RECEIVE_SMS
 - permission, 140
- android.provider.Telephony
 - SMS_RECEIVED, 140
- bundle property, 142
- Emulator Control UI, 142
- MySMSMonitor.java file, 141
- onReceive() method, 141–142
- PDU array, 142
- sending e-mail, 144
- sending messages
 - AndroidManifest.xml, 139
 - android.permission.SEND_SMS
 - permission, 135
 - android.telephony.SmsManager
 - class, 135
 - BroadcastReceiver, 137
 - EditText fields, 139
 - Java code, 135
 - PendingIntent, 137, 140
 - sendMultipartTextMessage(), 140
 - sendSmsMessage() method, 137, 139
 - splitting message, 137
 - user interface button, 139
- signupSuccessful() method, 131
- Simple suggestion provider
 - Java class, 279
 - metadata XML file, 279
 - search invoker activity, 288
 - search metadata, 287–288
 - SearchRecentSuggestionsProvider, 279
 - authority string, 280–281
 - base class, 280
 - key functionality, 281
 - manifest file, 281
 - mode bits, 282
 - protocol, 280
 - query strings, save, 282
 - save operation, 280
 - source code, 281
 - strings, 281
 - search results activity, 279
 - action attribute, 283
 - intent action, 283
 - java code, 283–284
 - layout file, 284
 - onCreate() method, 286
 - onNewIntent() method, 286
 - query string, 285
 - saveRecentQuery, 287
 - SearchableInfo, 285
 - user experience, 289–294
- SimpleTriangleRenderer2 class, 200
- SingleAbstractTextureRenderer class, 208
- SipAudioCall class, 151
- SipDemo, 149
- SipManager class, 150
- SipProfile class, 150
- SipSession class, 150
- Skype, 148
- SmsMessage.createFromPdu(), 142
- Soft phones, 149
- Stencil buffer, 178
- stride argument, 185
- String-based methods, 121–122
- Suggestion provider, 262
 - custom suggestion provider
 - (see SuggestUrlProvider)
 - simple suggestion provider
 - (see Simple suggestion provider)
- SuggestUrlProvider
 - base authority, 299
 - ContentProvider class methods, 298
 - getType() method, 300
 - queryAfterZeroResults attribute, 311
 - query() method, 298, 301–302
 - searchableinfo XML file, 302
 - search activity
 - ACTION_SEARCH and ACTION_VIEW, 316–317
 - finish(), 318
 - invocation, 315–316
 - layout, 317
 - manifest file, 318–319
 - onCreate(), 312, 317
 - onNewIntent(), 312, 317
 - source code, 314–315
 - SearchManager class, 299
 - SearchManager MIME type constants, 301
 - SearchSuggestAction attribute, 310–311
 - searchSuggestIntentData attribute, 311
 - searchSuggestPath attribute, 311
 - searchSuggestSelection attribute, 303
 - searchSuggestThreshold attribute, 311
 - search URI, 298
 - selectionArgs array, 302

SuggestUriProvider (*cont.*)
 source code, 306–309
 structure, 299
 suggestion cursor
 columns, 303, 305
 populating and returning, 305–306
 suggest shortcut URI, 299
 UriMatcher, 299–300
 URL, 297
 user experience, 304, 313, 319–322
 Surface buffers, 177

T

Telephony APIs
 SIP (see Session Initiation Protocol (SIP))
 SMS (see Short Message Service (SMS))
 telephony manager
 ACTION_ANSWER, 148
 android.permission.CALL_PHONE
 permission, 148
 android.permission.READ_PHONE_
 STATE permission, 147
 Emulator Control UI, 148
 incoming phone calls detection, 145
 listen() method, 147
 onCallStateChanged() method, 147
 PhoneStateListener, 147–148
 registering telephony
 state changes, 145
 TelephonyManager.getLine1Number(), 148
 template/hook pattern, 6
 TestBroadcastReceiver
 registering, 394
 source code, 393

Text messaging. See Short Message
 Service (SMS)
 Texture coordinates, 207
 Textured Square, 215
 TexturedSquareRenderer, 213
 TextView, 52

U

<uses-feature> tags, 107
 <uses-sdk> tag, 110

V

validateForm() method, 131
 Vertex, 176
 attributes, 182
 winding, 182
 Vertex shaders, 179, 219, 223
 View class, 3
 ViewGroup class, 3
 ViewGroup.getChildMeasureSpec(), 77
 ViewGroup.measureChild() method, 65
 ViewParent class, 3
 View point, 189
 View port coordinates, 181
 ViewRoot class, 3–4

W, X, Y, Z

widthMeasureSpec argument, 4
 Window/screen coordinates, 181
 World coordinates, 180, 184, 188
 Wrapping mode, 207
 writeParcel() method, 359
 writeToParcel() method, 19