

Index

&& (and) operator, GML, 232
// (comments), 248
{ } (curly brackets), GML, 228
= (equal) symbol, GML, 228
+ (increment) operator, GML, 229, 236
! (not) operator, GML, 232
|| (or) operator, GML, 232
_ (underscore) symbol
 filenames, 12
 GML, 229

A

action games, 87
actions, 14–18
 Destroy Instance, 176, 178
 Else, 70–71
 End Block. *See* blocks
 Execute Code. *See* Execute Code action
 Execute Script. *See* Execute Script action
 Set Score, 28–29, 32
 Super Rainbow Reef, 113
 Galactic Mail, 57–59, 61
 Set Time Line, 182–183
 Set Variable, 172
 boss plane object (*Wingman Sam*), 186–187
 enemy bullet objects (*Wingman Sam*), 185
 flying plane objects (*Wingman Sam*), 177,
 179–180
 Sleep, *Galactic Mail* flying rocket object, 59
 Start Block. *See* blocks
 Test Instance Count, *Galactic Mail* flying rocket
 object, 59
 Test Variable, 172
 boss plane object (*Wingman Sam*), 187
 enemy plane objects (*Wingman Sam*), 178
 flying plane objects (*Wingman Sam*), 175,
 179
 looping island objects (*Wingman Sam*), 173
 time lines, 182–183
 Wrap Screen. *See* Wrap Screen action
adaptive gameplay, *Tic-Tac-Toe* computer
 opponent, 256–257
Advanced mode (Game Maker), 10, 42–43
adventure games, 88
alarms
 Super Rainbow Reef
 stationary Pop object, 124–125
 congratulation object, 106–107

Tank War
 parent rocket object, 202
 pickup object, 200
 shell objects, 198
 wall object, 198
 Wingman Sam boss plane, 186–188
angles, *Super Rainbow Reef* Pop object, 110–111
animated characters. *See* Lazarus, Lazarus
 character
Anvil Studio, 292–293
arms races, 152
arrays (GML), 237–239
artificial stupidity, computer-controlled
 opponents, 220
assignment statements (GML), 228
asteroid object (*Galactic Mail*), 47–48
 adding visual variety, 62
 creating, 47–48
Audacity, 294
Audio Studio, 294
audio. *See* sound

B

baby dragon object (*Evil Clutches*), 31–32
backgrounds
 images (*Evil Clutches*), 33–34
 Lazarus, 82
 music
 Evil Clutches, 34–35
 Wingman Sam, 188
 scrolling (*Wingman Sam*), 173
 Tank War arena, 192–193
 Tic-Tac-Toe, 246
balancing (multiplayer games)
 beginnings, 214–218
 choice, 218–219
 computer-controlled opponents, 220
beetle object (*Pyramid Panic*)
 creating, 268
 making intelligent, 268–269
Begin Step event, koala object (*Koalabr8*), 134
behavior
 reactive behavior (*Pyramid Panic*), 267–269
 rule-based behavior (*Pyramid Panic*), 271–275
Bigleg object (*Super Rainbow Reef*), 113–116
 moving Bigleg, 116
 parent/child objects, 115–117
 small Bigleg, 115
 small moving Bigleg, 116

- block objects
 - Pyramid Panic, 270–271
 - Super Rainbow Reef*, 120–123
 - blocks, 59–60
 - End Block action
 - Galactic Mail*, 60
 - Lazarus*, 70–71
 - Start Block action
 - Galactic Mail*, 59
 - Lazarus*, 69, 71
 - boss object (*Evil Clutches*)
 - background music, 34–35
 - randomly creating baby dragons, 32
 - summoning demons, 30–31
 - boss plane (*Wingman Sam*)
 - adding hit counter, 186–187
 - creating plane object, 186
 - displaying hit counter, 187
 - making box more challenging, 187–188
 - bouncing bombs (*Tank War*)
 - creating, 203–204
 - shooting, 204–205
 - brackets (GML), 233
 - brainstorming features, 150–151
 - bullet object (*Wingman Sam*), 176
 - enemy bullets, 184–185
 - button objects (*Super Rainbow Reef*), 104
- C**
- calling functions, 231
 - challenges, 88–92
 - difficulty, 88–89
 - goals, 89–90
 - interactive challenges, 87
 - rewards, 90–91
 - subgoals, 92
 - Change Instance action
 - Galactic Mail*, 54
 - Lazarus*, 68, 70–71, 74, 76–77
 - Change Sprite action, 52–53
 - characters, balancing beginnings (multiplayer games), 214–218
 - cheats
 - Lazarus*, 82
 - Super Rainbow Reef*, 126
 - Check Collision action, 69, 79
 - Check Empty action, 69–72
 - Check Grid action, 132, 134
 - choice, 93–94
 - balancing, 218–219
 - code
 - executing, 225–228
 - Execute Code actions. *See* Execute Code actions
 - Execute Script actions. *See* Execute Script actions
 - scripts as functions, 240–242
 - writing. *See* GML
 - collisions/Collision event
 - Evil Clutches*
 - baby dragon, 31
 - demon object, 28–29
 - Galactic Mail*, flying rocket object, 54–55
 - Koalabr8*
 - exit objects, 136
 - saw objects, 139
 - sound effects, 148
 - Lazarus* (falling boxes), 74, 80
 - sound effects, 81
 - parent objects, 117
 - Pyramid Panic*
 - basic enemy object, 267–268
 - explorer colliding with scarab, 281
 - explorer with block objects, 271
 - explorer with treasure objects, 270
 - extending explorer object to handle collision with sword, 286–287
 - handling collision between explorer and scared mummy, 282
 - Potion object, 283
 - rule-based behavior, 272
 - wall object, 264
 - Super Rainbow Reef*
 - Bigleg object, 113
 - Pop and Katch objects, 111
 - Tank War*
 - bouncing bomb objects, 203–204
 - pickup object, 200
 - rocket objects, 202
 - shells, 198
 - tank objects, 201, 204
 - tanks, 193–194
 - Wingman Sam*, enemy planes, 178
 - color
 - changing mummy color (*Pyramid Panic*), 283
 - random color generation, 235
 - commands
 - File menu
 - Advanced Mode, 10, 42
 - Exit, 8
 - New, 42
 - Open, 7
 - Resources menu
 - Create Script, 225–226
 - Create Object, 14, 18
 - Create Room, 20
 - Create Sprite, 11, 13
 - Run menu, Run in Debug Mode, 243
 - comments, 248
 - comparison operators, 232

competition (multiplayer games), 211–214
 combining with cooperation, 213
 dependent, 212
 independent, 211
 completion screens
 Koalabr8, 130
 Pyramid Panic, 262
 Super Rainbow Reef, 106–107
 computer opponents
 balancing, 220
 Tic-Tac-Toe
 adaptive gameplay, 256–257
 simple logic, 251–254
 simple strategy, 254–256
 conditional actions, 58–59
 conditional statements, 232–234
 congratulation object, *Super Rainbow Reef*
 completion screen, 106
 control, 93–94
 controller objects, 75
 Koalabr8, 135
 adding events to handle rescued koalas,
 136–137
 creating, 135
 editing to fix dead koala bug, 138–139
 Lazarus, 75–77
 Pyramid Panic
 creating, 262–263
 extending, 266, 286
 Super Rainbow Reef
 adding no more lives event, 118–119
 creating, 113
 showing remaining lives, 119
 Tank War, 193
 creating, 193
 drawing scores, 208–209
 recording scores, 195
 Wingman Sam
 creating, 179
 playing background music, 188
 cooperative multiplayer games, 213–214
 combining with competition, 213
 dependent, 213
 independent, 213
 Wingman Sam. *See* *Wingman Sam* game
 Cosmigo Pro Motion, 292
 Create event, 25
 Create Instance action, 57
 Create Object command (Resources menu), 14, 18
 Create Random action, 77
 Create Room command (Resources menu), 20
 Create Script command (Resources menu),
 225–226
 Create Sprite command (Resources menu), 11, 13
 Cubase SE, 293
 curly brackets {}, GML, 228
 cyclic relationships, 218–219

D

damage, *Tank War*
 damage mechanism, 196–197
 health bars, 197
 darkness (*Pyramid Panic*), 284
 adding behavior of mummy object, 288
 creating sword object (Sword of Ra), 286
 dead koala object (*Koalabr8*), 138
 debugging programs, 242–243
 delayed actions, stationary Pop object (*Super
 Rainbow Reef*), 124–125
 demon object (*Evil Clutches*), 27–29
 summoning demons, 30–31
 dependent competition, 212
 dependent cooperation, 213
 depth, 47
 Galactic Mail
 asteroid object, 47–48
 explosion object, 56
 flying rocket object, 53
 landed rocket object, 51
 special moon object, 50
 title object, 60
 design, 9
 challenges, 88–92
 difficulty, 88–89
 goals, 89–90
 rewards, 90–91
 subgoals, 92
 emergence, 153, 161
 springs (*Koalabr8*), 161
 features, 149–154
 arms races, 152
 brainstorming, 150–151
 emergence, 153
 equivalent features, 151
 Koalabr8, 160–161
 one-trick ponies, 152
 Galactic Mail, 41–42
 game mechanics, 86–87
 genres, 87–88
 good game design, 85–86
 interactivity, 92–95
 audio feedback, 95
 choices and control, 93–94
 interactive challenges, 87
 unfair punishment, 94
 Koalabr8, 127–128
 Lazarus, 65
 levels, 154–159
 difficulty curves, 158–159
 dividing levels, 162–163
 learning curves, 156–159
 training levels, 161–162

- multiplayer games
 - balancing beginnings, 214–218
 - balancing choice, 218–219
 - balancing computer-controlled opponents, 220
 - competition, 211–214
 - cooperation, 213–214
 - providing opportunities to save, 160
 - Pyramid Panic*, 259–260
 - Super Rainbow Reef*, 101–103
 - Tank War*, 191–192
 - balancing choice, 218–219
 - balancing computer opponents, 220
 - balancing tank differences, 215–218
 - Tic-Tac-Toe*, 245–246
 - Wingman Sam*, 169–170
 - Destroy Instance action, 28
 - Galactic Mail*, 57
 - Lazarus*, 74
 - Wingman Sam*
 - bullet object, 176
 - enemy planes, 178
 - detonator object (*Koalabr8*), 144–145
 - difficulty, 88–89. *See also* challenges
 - difficulty curves, level design, 158–159
 - disabling Esc key (*Super Rainbow Reef*), 124
 - Display Messages
 - Lazarus*, 69, 80
 - Pyramid Panic*, 262
 - Draw actions, 137
 - Draw event, 119
 - showing remaining lives (*Super Rainbow Reef*), 119
 - tanks (*Tank War*), 193–194, 197
 - Draw Life Images action (*Koalabr8*), 137
 - Draw Sprite action, 119
 - drawing, *Tic-Tac-Toe*
 - field, 250
 - stones, 250
 - drawing functions (GML), 231
- E**
- Else action, 70–71
 - emergence, 153, 161
 - Koalabr8*, 161
 - End Block action
 - Galactic Mail*, 60
 - Lazarus*, 70–71
 - End Steps, 51
 - equivalent characters (multiplayers), 214
 - equivalent features, 151
 - Esc key, disabling (*Super Rainbow Reef*), 124
 - events, 14–19. *See also* individual event names
 - inheritance, 117
 - Evil Clutches* game, 9–10
 - adding challenges/rewards, 88–92
 - adding interactivity, 92–95
 - baby dragon object, 31–32
 - background
 - image, 33–34
 - music, 34–35
 - boss object, 13–17
 - background music, 34–35
 - randomly creating baby dragons, 32
 - summoning demons, 30–31
 - demon object, 27–29
 - designing, 9–10
 - dragon object, 18–19
 - fireball object, 24–27
 - rooms, 20–22
 - running, 23
 - sound effects, 35–36
 - sprites, 10–13
 - summoning demons, 30
 - Evil Squares* game, 86
 - Execute Code actions, 225
 - Pyramid Panic*, 263
 - basic enemy, 267–268
 - beetle object, 268
 - block objects, 270–271
 - different mummy object, 279
 - explorer object, 264–265, 281–282, 286–287
 - explorer/mummy collision, 282
 - mummy object, 273
 - potion object, 283
 - treasure objects, 270
 - Execute Script actions, 225–228
 - scripts as functions, 240–242
 - Pyramid Panic*
 - controller object, 286
 - different mummy object, 278–279
 - mummy object, 277
 - exit objects (*Koalabr8*), 136
 - explorer object (*Pyramid Panic*)
 - creating object, 264–265
 - creating sprites, 263
 - extending, 281–282, 286–287
 - handling collision between explorer and scared mummy, 282
 - explosions
 - Galactic Mail*, 56–57
 - Tank War*, 195–196
 - Wingman Sam*, 178
- F**
- falling boxes (*Lazarus*). *See* *Lazarus* game, falling boxes
 - false keyword, 171
 - features, 149–154
 - arms races, 152
 - brainstorming, 150–151
 - emergence, 153
 - equivalent features, 151

- Koalabr8*, 160–161
- one-trick ponies, 152
- field object (*Tic-Tac-Toe*), 247–248
 - creating, 247
 - initializing, 247–248
- File menu commands
 - Advanced Mode, 10, 42
 - Exit, 8
 - New, 42
 - Open, 7
- files
 - filenames, 12, 14
 - opening, 7
- finish object (*Galactic Mail*), 61
- finish room (*Galactic Mail*), 62
- fireball object (*Evil Clutches*), 25–27
- flying planes (*Wingman Sam*), 174–176. *See also*
 - Wingman Sam* game
 - adding damage variable, 179–180
 - creating information panel, 180–181
 - displaying scores, 181
- flying rocket object (*Galactic Mail*)
 - adding collision events, 54–55
 - creating, 53–54
 - editing, 57–60
- fonts, 247
- for loops, 236
- forward slashes (/), comments, 248
- frameworks
 - Koalabr8*, 129–131
 - completion screen, 130
 - front-end, 129–130
 - game settings, 130
 - Super Rainbow Reef*, 103–107
 - completion screen, 106–107
 - front-end, 103–106
- friction, *Tank War*, 193
- full screen option, 23
- functions, 230–232
 - executing scripts as functions, 240–242

G

- Galactic Mail* game
 - adding Game Information, 62–63
 - asteroid object, 47–48
 - adding visual variety, 62
 - creating, 47–48
 - design, 41–42
 - explosion object, 56–57
 - finish object, 61
 - finish room, 62
 - flying rocket object
 - adding collision events, 54–55
 - creating, 53–54
 - editing, 57–60
 - landed rocket object
 - creating, 51–52
 - including a Key Press event, 55–56
 - including change sprite action, 52–53
 - including keyboard events, 53
 - levels, 58–60
 - moon object, 45–47
 - adding create event, 46–47
 - adding visual variety, 62
 - creating, 45–46
 - including wrap action, 47
 - rooms, creating/populating with moons and
 - asteroids, 48–49
 - running, 49–50
 - scoring
 - Set Score action, 57–58, 61
 - Show Highscore action, 56
 - sound, 45
 - special moon object, 50
 - sprites, 43–44
 - title screen, 60–61
- Galactic Squares* game, 86
- Game Information, 62–63
 - Galactic Mail*, 62–63
 - Super Rainbow Reef*, 106
- Game Maker, 3–8
 - Advanced mode, 42–43
 - installing, 3–5
 - interface, 6, 11
 - registering, 3, 5
 - system requirements, 4
 - website, 5, 8
- Game Maker Language. *See* GML
- Game Maker online community, 294–295
- game mechanics, 86–87
- game over message (*Lazarus*), 79–80
- gamelearning.net teacher's forum, 295
- games
 - designing, 9
 - Evil Clutches*. *See* *Evil Clutches* game
 - Evil Squares*, 86
 - frameworks. *See* frameworks
 - Galactic Mail*. *See* *Galactic Mail* game
 - Galactic Squares*, 86
 - genres, 87–88
 - Koalabr8*. *See* *Koalabr8* game
 - Lazarus Squares*, 86
 - Lazarus*. *See* *Lazarus* game
 - Pyramid Panic*. *See* *Pyramid Panic* game
 - running, 6–8, 22–23
 - saving, 22
 - Super Rainbow Reef*. *See* *Super Rainbow Reef* game
 - Tank War*. *See* *Tank War* game
 - Tic-Tac-Toe*. *See* *Tic-Tac-Toe* game
 - Wingman Sam*. *See* *Wingman Sam* game

- genres, 87–88
 - GIMP (GNU Image Manipulation Program), 291–292
 - Global Game Settings
 - Koalabr8*, 130
 - Pyramid Panic*, 262
 - Wingman Sam*, 188–189
 - global variables, 171, 230. *See also* variables
 - GML (Game Maker Language), 225
 - applying code to other instances (with statement), 239–240
 - arrays, 237–239
 - assignment statements, 228
 - conditional statements, 232–234
 - creating scripts, 225–226
 - debugging, 242–243
 - executing scripts, 225–228
 - scripts as functions, 240–242
 - function, 230–232
 - Hello World program, 226–228
 - keywords, 230
 - loops, 234–237
 - opening and closing brackets, 233
 - operators, 228
 - comparison operators, 232
 - random color generation, 235
 - return statement, 242
 - variables, 228–230
 - incrementing, 236
 - GNU Image Manipulation Program (GIMP), 291–292
 - goals, 89–90. *See also* challenges
 - good game design, 85–86
 - GraphicsGale, 292
 - gravity
 - dead koala object (*Koalabr8*), 138
 - Pop object (*Super Rainbow Reef*), 110
 - grids, 132–134
 - guns (*Wingman Sam*)
 - bullet objects, 176
 - enemy bullets, 184–185
 - key release events, 177
 - shooting keyboard events, 177
- ## H
- hazards (*Koalabr8*)
 - dead koala object, 137–138
 - detonators, 144–145
 - fixing dead koala bug, 138–139
 - locks and switches, 143–144
 - rocks, 145–147
 - saws, 139, 146
 - TNT, 138
 - health bars (*Tank War*), 197
 - Hello World program, 226–228
 - help, 8
 - adding Game Information, 62–63
 - hiding
 - objects, 142
 - tiles, 142
 - hit counters (*Wingman Sam* boss plane object), 186–187
 - Hogs of War, 153–154
 - HUMANBALANCE Co. GraphicsGale, 292
- ## I
- images
 - backgrounds (*Evil Clutches*), 33–34
 - GNU Image Manipulation Program (GIMP), 291–292
 - incrementing variables, 236
 - independent competition, 211–212
 - independent cooperation, 213
 - inheriting events, 117
 - initialize statement, loops, 236
 - installing Game Maker, 3–5
 - instance functions (GML), 231–232
 - instances, 24
 - applying code to other instances, 239–240
 - interactivity, 92–95
 - audio feedback, 95
 - choices and control, 93–94
 - interactive challenges, 87
 - unfair punishment, 94
 - interface (Game Maker), 6, 11
 - invisible blocks (*Super Rainbow Reef*), 121
 - invisible walls (*Koalabr8*), 142
 - island objects (*Wingman Sam*), 173–174
- ## J
- Jump Position action
 - Galactic Mail*, 51
 - Lazarus*, 68, 72, 74
- ## K
- Katch object (*Super Rainbow Reef*), 108–112
 - Key Press event
 - Evil Clutches* dragon/fireball objects, 26–27
 - Galactic Mail* landed rocket object, 55–56
 - Lazarus* character, 69–71
 - key release event, 177
 - Keyboard actions (*Koalabr8*), 133–134
 - keyboard events
 - Galactic Mail*, 53
 - Tank War*, 194
 - Wingman Sam*
 - movement events, 175–176
 - shooting events, 177
 - keywords
 - GML, 230
 - true/false, use with variables, 171

- Koalabr8* game, 127–128
 - controller object, 135
 - adding events to handle rescued koalas, 136–137
 - creating, 135
 - editing to fix dead koala bug, 138–139
 - design, 127–128
 - exit objects, 136
 - features, 160–161
 - framework, 129–131
 - completion screen, 130
 - front-end, 129–130
 - game settings, 130
 - hazards
 - dead koalas, 138
 - detonators, 144–145
 - fixing dead koala bug, 138–139
 - locks and switches, 143–144
 - rocks, 145–147
 - saws, 139, 146
 - TNT, 138
 - koala object
 - adding Begin Step event, 134
 - creating koala object, 132–134
 - creating koala sprite, 131–132
 - dead koalas, 138
 - levels
 - dividing levels, 162–163
 - training levels, 161–162
 - locks and switches, 143–144
 - restart button, 147
 - rooms
 - adding tiles, 141–142
 - test room, 135–136
 - saw objects, 139
 - creating, 139–140
 - making saws turn for rocks, 146
 - sound effects, 148
 - springs, 161, 163
 - tiles, 140–142
 - adding tiles to rooms, 141–142
 - creating tile set, 140–141
 - making walls invisible, 142
 - wall object
 - creating, 131
 - making walls invisible, 142
- L**
- landed rocket object (*Galactic Mail*)
 - creating, 51–52
 - including a Key Press event, 55–56
 - including change sprite action, 52–53
 - including keyboard events, 53
 - Lazarus* game, 65–66
 - background, 82
 - completing game, 79–80
 - design, 65–66
 - detecting for Lazarus being trapped/freed, 78–79
 - falling boxes, 73–78
 - creating box sprite and box objects, 74
 - creating controller object, 76–77
 - creating falling box objects, 74–75
 - creating next box object, 75
 - testing, 78
 - Game Information, 82
 - Lazarus character, 66–72
 - adding key events, 69–71
 - adding Step event, 71–72
 - creating Lazarus object, 68
 - creating sprite, 67–68
 - creating squished Lazarus object, 68–69
 - Else action, 70–71
 - levels
 - adding cheats, 82
 - creating, 82
 - reaching new levels, 79–80
 - starter object, 80
 - sound effects, 81
 - test room, 72–73, 78
 - wall object, 72–73
 - Lazarus Squares* game, 86
 - learning curves, level design, 156–157, 159
 - levels
 - adaptive gameplay (*Tic-Tac-Toe* computer opponent), 256–257
 - design, 154–159
 - difficulty curves, 158–159
 - learning curves, 156–157, 159
 - dividing levels, 162–163
 - Galactic Mail*, 58–60
 - Koalabr8*
 - dividing levels, 162–163
 - training levels, 161–162
 - Lazarus*. *See Lazarus* game, levels
 - Super Rainbow Reef*, 125–126
 - training levels, 161–162
 - views. *See* views
 - levels of difficulty, 88–89. *See also* challenges
 - light (*Pyramid Panic*), changing room to darkness, 284
 - adding behavior of mummy object, 288
 - creating sword object (Sword of Ra), 286
 - extending explorer object, 287
 - lives (*Super Rainbow Reef*), 117–119
 - local variables, 230
 - locks (*Koalabr8*), 143–144
 - logic (*Tic-Tac-Toe* computer opponent), 251–254
 - loops
 - GML, 234–237
 - Wingman Sam* island objects, 173–174

M

mazes

Pyramid Panic

- adapting room, 265

- creating wall objects, 263

Koalabr8. See *Koalabr8*

- mechanics, 86–87

- MIDI Tracker, 293

- moments, time lines, 182–183

- moon object (*Galactic Mail*), 45–47

- adding create event, 46–47

- adding visual variety, 62

- creating, 45–46

- special moon object, 50

- including wrap action, 47

- motion (*Wingman Sam*)

- looping island objects, 173–174

- scrolling background, 173

- movable block objects (*Pyramid Panic*), 270–271

- Move Fixed action, 15–16, 19–20

- Evil Clutches*, 31

- Lazarus*, 74

- setting speed of 0, 134

- Move Free action (*Galactic Mail* moon object),

- 46–47

- movement keyboard events (*Wingman Sam*

- planes), 175–176

- multiplayer games

- balancing computer-controlled opponents, 220

- competition and cooperation, 211–214

- Tank War*. See *Tank War* game

- Wingman Sam*. See *Wingman Sam* game

- mummies (*Pyramid Panic*)

- adapting mummy behavior to darkness, 288

- changing color, 283

- creating, 272–273

- afraid mummy, 280

- different mummy, 279

- giving mummy object behavior, 273–274

- handling collision between explorer and scared

- mummy, 282

- moving mummy toward explorer, 275–277

- music

- background

- Evil Clutches*, 34–35

- Wingman Sam*, 188

- creating, 292–293

N

- naming resources, 12, 14

- New command (File menu), 42

O

- Object Properties form, 14–19, 32

- objects, 13–20

- actions, 14–18

- adding to rooms, 21–22

- assigning sprites, 14

- creating, 14, 18

- afraid mummy (*Pyramid Panic*), 280

- asteroid (*Galactic Mail*), 47–48

- baby dragon (*Evil Clutches*), 31–32

- basic enemy (*Pyramid Panic*), 267–268

- beetle (*Pyramid Panic*), 268

- Bigleg (*Super Rainbow Reef*), 113–116

- blocks (*Pyramid Panic*), 270–271

- boss (*Evil Clutches*), 30–35

- boss plane (*Wingman Sam*), 186

- bouncing bombs (*Tank War*), 203–204

- boxes (*Lazarus*), 74–75

- bullets (*Wingman Sam*), 176, 184–185

- buttons (*Super Rainbow Reef*), 104

- congratulation object (*Super Rainbow Reef*), 106

- controller objects. See controller objects

- dead koala (*Koalabr8*), 138

- demon (*Evil Clutches*), 27–28

- detonator (*Koalabr8*), 144–145

- different mummy (*Pyramid Panic*), 279

- enemy bullets (*Wingman Sam*), 184–185

- enemy planes (*Wingman Sam*), 178, 184

- enemy planes that shoot (*Wingman Sam*), 185

- exit objects (*Koalabr8* maze), 136

- explorer (*Pyramid Panic*), 264–265

- explosion object (*Galactic Mail*), 56–57

- explosions (*Tank War*), 195–196

- field object (*Tic-Tac-Toe*), 247

- finish object (*Galactic Mail*), 61

- fireball (*Evil Clutches*), 25

- flying rocket object (*Galactic Mail*), 53–54

- Katch (*Super Rainbow Reef*), 108–109

- koalas (*Koalabr8*), 132–134

- landed rocket (*Galactic Mail*), 51–52

- Lazarus* (*Lazarus*), 68

- locks (*Koalabr8*), 143–144

- looping islands (*Wingman Sam*), 173–174

- moon (*Galactic Mail*), 45–46

- mummy (*Pyramid Panic*), 272–273

- pickup (*Tank War*), 200

- planes (*Wingman Sam*), 175

- Pop (*Super Rainbow Reef*), 109–111

- potion (*Pyramid Panic*), 283

- restart button (*Koalabr8*), 147

- rockets (*Tank War*), 202

- rocks (*Koalabr8*), 145

- saws (*Koalabr8*), 139

- scarab (*Pyramid Panic*), 280–281

- scorpion (*Pyramid Panic*), 269

- shells (*Tank War*), 198

- special moon (*Galactic Mail*), 50

- squished *Lazarus* (*Lazarus*), 68–69

- switches (*Koalabr8*), 143–144

- sword (*Pyramid Panic*), 286

- tanks (*Tank War*), 193–194
 - title (*Galactic Mail*), 60–61
 - title (*Super Rainbow Reef*), 104
 - TNT object (*Koalabr8*), 138
 - treasure (*Pyramid Panic*), 269–270
 - wall (*Koalabr8*), 131
 - wall (*Lazarus*), 72–73
 - wall (*Super Rainbow Reef*), 108
 - controller objects. *See* controller objects
 - depth (*Galactic Mail*), 47
 - asteroid, 47–48
 - explosion, 56
 - flying rocket, 53
 - landed rocket, 51
 - special moon, 50
 - title, 60
 - events, 14–19
 - hiding, 142
 - instances, 24
 - parents, 115–117
 - one-trick ponies, 152
 - online Game Maker community, 294–295
 - opening files, 7
 - operators (GML), 228–229, 232
 - opponents. *See* competition (multiplayer games); computer opponents
 - Outside room event (*Evil Clutches* baby dragon), 31
- P**
- parent objects, 115–117
 - rockets (*Tank War*), 202
 - shells (*Tank War*), 198
 - tanks (*Tank War*)
 - adding damage mechanism, 196–197
 - creating, 193–194
 - displaying secondary weapons, 201–202
 - drawing health bars, 197
 - editing to support shields, 204–205
 - recording pickups, 201
 - parentheses (), GML, 232
 - pickups (*Tank War*), 200–201
 - planes (*Wingman Sam*)
 - boss plane
 - adding hit counter, 186–187
 - creating plane object, 186
 - displaying hit counter, 187
 - making box more challenging, 187–188
 - enemy planes
 - bullets, 184–185
 - creating planes, 178, 184
 - creating planes that shoot, 185
 - explosions, 178
 - flying planes, 174–176
 - adding key release events, 177
 - adding movement keyboard events, 175–176
 - adding shooting keyboard events, 177
 - creating plane objects, 175
 - damage variable, 179–180
 - displaying scores, 181
 - information panel, 180–181
 - Play Sound action, 34, 58
 - Pop object (*Super Rainbow Reef*), 108–112, 124–125
 - potion object (*Pyramid Panic*), 283
 - Pro Motion, 292
 - programming. *See* GML
 - properties, variables, 170–172
 - Pyramid Panic* game, 259
 - basic enemy object, 267–268
 - beetle object
 - creating, 268
 - making intelligent, 268–269
 - block objects, 270–271
 - changing room to darkness, 287–288
 - completion screen, 262
 - controller object
 - creating, 262–263
 - extending, 266–286
 - design, 259–260
 - explorer
 - creating object, 264–265
 - creating sprites, 263
 - extending object, 281–282, 286–287
 - handling collision between explorer and scared mummy, 282
 - front-end, 261
 - game settings, 262
 - maze
 - adapting basic room, 265
 - adapting room, 265
 - creating wall objects, 263
 - mummy objects
 - adapting behavior to darkness, 288
 - changing color, 283
 - creating, 272–273
 - creating afraid mummy, 280
 - creating different mummy, 279
 - giving mummy behavior, 273–274
 - moving mummy toward explorer, 275
 - potion object, creating, 283
 - rooms
 - adapting basic room for maze, 265
 - adapting room for maze, 265
 - basic room, 263
 - completion room, 262
 - front-end room, 261
 - rule-based behavior, 271–272
 - creating mummy object, 272–273
 - making mummies walk, 273–274
 - moving mummy toward explorer, 275
 - scarab object, 280–281
 - scoring
 - completion screen setup, 262
 - extending score display, 282

- front-end setup, 261
- Sword of Ra, 286–287
- scorpion object, 269
- states, 279
- sword object, 286
- treasure objects, 269–270
- view, 266

R

reactive behavior (*Pyramid Panic*), 267–269

Relative option, Set Variable action, 172

Relative property

- Collision event, 28–29

- Key Press event, 26–27

repeat loops, 234–235

Resource menu commands

- Create Script, 225–226

- Create Object, 14, 18

- Create Room, 20

- Create Sprite, 11, 13

resources

- creating

- images, 291–292

- music, 292–293

- sound effects, 294

- filenames, 12, 14

- rooms, 20–22. *See also* rooms

- sprites. *See* sprites

- time lines, 182–183

Resources menu commands

- Create Object, 14, 18

- Create Room, 20

- Create Sprite, 11, 13

restart buttons, 147

Restart Game action, 29

Restart Room action, 69

return statement, 242

Reverse Vertical action, 17

rewards, 90–91. *See also* challenges

RF1 Systems MIDI Tracker, 293

rock object (*Koalabr8*), 145–147

rocket objects (*Galactic Mail*)

- flying rocket, 53–60

- landed rocket, 51–56

role-playing games (RPGs), 88

Room Properties form, 20–21

rooms, 20–22

- adding objects, 21–22

- backgrounds. *See* backgrounds

- creating, 20–21

- Galactic Mail*, 48–49

- finish room, 62

- title room, 61

- Koalabr8*

- adding tiles, 141–142

- test room, 135–136

- Lazarus*

- Restart Room action, 69

- test room, 72–73, 78

- leaving instances outside rooms, warning message, 72

Pyramid Panic

- adapting basic room for maze, 265

- adapting room for maze, 265

- basic room, 263

- completion room, 262

- front-end room, 261

Speed, 51

Super Rainbow Reef

- completion room, 107

- front-end room, 105

- test room, 112–114

Tank War, 193

- views, 205–209

test rooms

- Koalabr8*, 135–136

- Lazarus*, 72–73, 78

- Super Rainbow Reef*, 112–114

Tic-Tac-Toe, 247

rotating sprites, 52

RPGs (role-playing games), 88

rule-based behavior (*Pyramid Panic*), 271–272

- creating mummy object, 272–273

- giving mummy object behavior, 273–274

- moving mummy toward explorer, 275

Run in Debug Mode command (Run menu), 243

running games, 6–8, 22–23, 49–50

S

saving, 22

- providing opportunities to save, 160

- Super Rainbow Reef*, 123–124

saw objects (*Koalabr8*), 139, 146

scarab object (*Pyramid Panic*), 280–281

scoring

Galactic Mail

- Set Score action, 57–59, 61

- Show Highscore action, 56, 61

Pyramid Panic

- completion screen setup, 262

- extending score display, 282

- front-end setup, 261

- Sword of Ra, 286–287

Set Score action, 28–29, 32, 57–61

Show Highscore action, 29, 56, 61

Tank War

- drawing scores, 208–209

- recording scores in controller object, 195

Tic-Tac-Toe, 248

Wingman Sam, displaying scores/high-score table, 181

scorpion object (*Pyramid Panic*), 269

- scripts. *See also* GML
 - conditional statements, 232–234
 - debugging, 242–243
 - executing, 227–228
 - scripts as functions, 240–242
 - Pyramid Panic*
 - changing room to darkness, 286
 - making mummies walk, 274
 - moving mummies toward explorers, 275–276
 - return statement, 242
 - Tic-Tac-Toe*
 - adaptive gameplay, 256–257
 - computer opponent simple logic, 251–254
 - computer opponent simple strategy, 254–256
 - creating/executing, 248–249
 - drawing field, 250
 - drawing stones, 250
 - field click, 248–249
 - initializing field object, 247–248
 - mouse click, 249
 - writing, 225–226. *See also* GML
- scrolling background (*Wingman Sam*), 173
- Scrolling Shooter game style, 173
- Set Score action, 28–29, 32
 - Super Rainbow Reef*, 113
 - Galactic Mail*, 57–61
- Set Time Line action, 182–183
- Set Variable action, 172
 - Wingman Sam*
 - boss plane object, 186–187
 - enemy bullet objects, 185
 - flying plane objects, 177–180
- shell objects (*Tank War*)
 - creating parent shells, 198
 - creating players' shells, 199
 - firing shells, 199
- shields (*Tank War*), 204–205
- shooting (*Wingman Sam*)
 - bullet objects, 176
 - enemy bullets, 184–185
 - enemy plane objects, 185
 - key release events, 177
 - keyboard events, 177
- Show Highscore action, 29, 56, 61
- Simple mode, 11
- simulator games, 87
- Sleep action
 - Galactic Mail*, 59
 - Lazarus*, 80
- small Bigleg object (*Super Rainbow Reef*), 115
- solid blocks (*Super Rainbow Reef*), 120–121
- Solid option (*Lazarus*), 72–74
- sound
 - audio feedback, 95
 - explosions (*Wingman Sam*), 178
 - Galactic Mail*, 45
 - Lazarus*, 81
 - music
 - background music, 34–35
 - creating, 292–293
 - Play Sound action, 34, 58
 - Pyramid Panic*, 261
 - Super Rainbow Reef*, 123
- sound effects
 - creating, 294
 - Evil Clutches*, 35–36
 - Koalabr8*, 148
 - Tic-Tac-Toe*, 246
- Sound Forge Audio Studio, 294
- Sound Properties form, 35
- special moon object (*Galactic Mail*), 50
- speed, 51
- springs (*Koalabr8*), 161, 163
- Sprite Editor, 44–45
- Sprite Properties form, 11–12, 44
- sprites, 10–13
 - assigning to objects, 14
 - change sprite action (*Galactic Mail*), 52–53
 - creating, 11–13
 - Galactic Mail*, 43–44
 - Koalabr8*, 131–132
 - Lazarus character, 67–68, 74
 - Tic-Tac-Toe*, 246
- Draw Sprite action, 119
- Pyramid Panic* explorer, 263
- rotating, 52
- Transparent option, 12–13
- Wingman Sam*
 - boss hit counter, 187
 - boss plane, 186
 - bullets, 176
 - enemy bullets, 184
 - enemy planes, 178, 184
 - enemy planes that shoot, 185
 - flying planes, 175
 - information panel, 180
 - island objects, 173
- starfish game. *See Super Rainbow Reef* game
- Start Block action
 - Galactic Mail*, 59
 - Lazarus*, 69, 71
- statements (GML), 228
 - assignment statements, 228
 - conditional statements, 232–234
- states (*Pyramid Panic* mummy object), 278–279
- Steinberg Cubase SE, 293
- Steps, 51
 - landed rocket object (*Galactic Mail*), 51
 - Lazarus character, 71–72
- strategy (*Tic-Tac-Toe* computer opponent), 254–256
- strategy games, 87
- subgoals, 92
- Super Rainbow Reef* game, 101–103

- Bigleg object, 113–116
 - moving Bigleg, 116
 - small Bigleg, 115
 - small moving Bigleg, 116
- blocks, 120–123
 - normal blocks, 120
 - solid blocks, 120–121
 - special blocks, 121–123
- design, 101–103
- disabling Esc key, 124
- framework, 103–107
 - completion screen, 106–107
 - front-end, 103–106
- Game Information, 106
- levels, 125–126
- lives, 117–119
- parent/child objects, 115–117
- Pop and Katch objects, 108–112
 - stationary Pop, 124–125
- possible split-screen multiplayer version, 211–212
- rooms
 - completion room, 107
 - front-end room, 105
 - test room, 112–114
- saving games, 123–124
- sound effects, 123
- wall object, 108
- switches (*Koalabr8*), 143–144
- sword object (*Pyramid Panic*), 286

T

- Tank War* game, 191
 - arena, 192–193
 - background sound, 193
 - controller object, 193
 - creating, 193
 - drawing scores, 208–209
 - recording scores, 195
 - damage mechanism, 196–197
 - design, 191–192
 - balancing choice, 218–219
 - balancing computer opponents, 220
 - balancing tank differences, 215–218
 - explosions
 - large explosion objects, 195–196
 - small explosion objects, 196
 - health bars, 197
 - pickups
 - creating pickup object, 200
 - recording, 201
 - room, 193. *See also* *Tank War*, views
 - scoring
 - drawing scores, 208–209
 - recording scores in controller object, 195
 - secondary weapons, 199
 - bouncing bombs, 203–205

- displaying, 201–202
 - rockets, 202–203
- shells
 - creating parent shell object, 198
 - creating players' shell objects, 199
 - firing, 199
- shields, 204–205
- tank objects, 193–194
- views, 205–209
- walls
 - creating, 192–193
 - editing wall object to make it reappear, 198
- teacher's forum at gamelearning.net, 295
- Test Instance Count action
 - flying rocket object (*Galactic Mail*), 59
 - Lazarus*, 76
- test rooms
 - Koalabr8*, 135–136
 - Lazarus*, 72–73, 78
 - Super Rainbow Reef*, 112–114
- Test Variable action, 172
 - Wingman Sam*
 - boss plane object, 187
 - enemy plane objects, 178
 - flying plane objects, 175, 179
 - looping island objects, 173
- Tic-Tac-Toe* game
 - background, 246
 - computer opponent
 - adaptive gameplay, 256–257
 - simple logic, 251–254
 - simple strategy, 254–256
 - design, 245–246
 - drawing stones, 250
 - field object, 247–248
 - creating, 247
 - drawing, 250
 - initializing, 247–248
 - field_click script, 248–249
 - font, 247
 - mouse click script, 249
 - room, 247
 - scoring, 248
 - sound effects, 246
- tiles, *Koalabr8*, 140–142
 - adding to rooms, 141–142
 - creating tile set, 140–141
 - hiding, 142
 - making walls invisible, 142
- time lines, 182–183
- title object, *Super Rainbow Reef*
 - adding create event, 118
 - creating, 104
- title screen, *Galactic Mail*, 60–61
- TNT object (*Koalabr8*), 138
- Transparent option, sprites, 12–13
- treasure objects (*Pyramid Panic*), 269–270

true keyword, use with variables, 171

U

underscore (_) symbol

filenames, 12

GML, 229

unfair punishment, 94

upgrading Game Maker, 3, 5

user interface (Game Maker), 6, 11

V

var keyword (GML), 230

variables, 63, 170–172

Collision event (*Tank War*), 194

incrementing (GML), 236

keyboard events (*Tank War*), 194

properties, 170–172

Set Variable action, 172

boss plane object (*Wingman Sam*), 186–187

enemy bullet objects (*Wingman Sam*), 185

flying plane objects (*Wingman Sam*), 177, 179–180

Test Variable action, 172

boss plane object (*Wingman Sam*), 187

enemy plane objects (*Wingman Sam*), 178

flying plane objects (*Wingman Sam*), 175, 179

looping island objects (*Wingman Sam*), 173

using in scripts, 228–230

views

Pyramid Panic, 266

Tank War, 205–209

Visible option, walls (*Koalabr8*), 142

W

wall object

walls

Koalabr8

creating, 131

making walls invisible, 142

Lazarus, 72–73

Pyramid Panic, creating, 263

Tank War arena

creating, 192–193

editing wall object to make it reappear, 198

weapons

Tank War

bouncing bombs, 203–205

displaying secondary weapons, 201–202

rockets, 202–203

shells, 198–199

Wingman Sam, 176–179

website (Game Maker), 5, 8

weighting choices (multiplayer games), 218

while loops, 235–236

Willow Software Anvil Studio, 292–293

Wingman Sam game, 169–170

background music, 188

boss plane

adding hit counter, 186–187

creating plane object, 186

displaying hit counter, 187

making box more challenging, 187–188

bullet object, 176

enemy bullets, 184–185

controller object

creating, 179

playing background music, 188

design, 169–170

displaying scores/high-score table, 181

editing global game settings, 188–189

enemy planes

creating bullets, 184–185

creating planes, 178, 184

creating planes that shoot, 185

explosions, 178

flying planes, 174–176

adding key release events, 177

adding movement keyboard events, 175–176

adding shooting keyboard events, 177

creating plane objects, 175

damage variable, 179–180

information panel, 180–181

independent cooperation, 213

motion

looping island objects, 173–174

scrolling background, 173

single player version, 179

time lines, 182–183

with statement

GML, 239–240

Pyramid Panic basic enemy object, 268

Wrap Screen action, 45, 47

writing scripts, 225–226. *See also* GML

Z

Zelda: Wind Waker, 85