Index

Note to the Reader: Throughout this index **boldfaced** page numbers indicate primary discussions of a topic. *Italicized* page numbers indicate illustrations.

A

Abbot framework, 27
AccessCheckAndAuditAlarm function, 351
accessibility in XML, 187–189
active test approach, 31–32
ActiveX controls, 390
testing, 406–410, 407–410
from Visual Studio 6, 393–394, 394
Add button, verifying, 204, 204
Add Existing Project dialog box, 311
Add key, SendKeys code for, 336
Add method
in Collections, 50
for combo boxes, 79
in DefinitionList, 51
in GUISortedList, 222
Add New Item dialog box, 49, 50
Add Reference dialog box, 311
AddCSharpCode method, 51–52, 60, 65
AddExpectedContent method, 280–282, 286
AddTestVerification method
for RadioButton and CheckBox controls, 363
for user-defined controls, 401–402
for verification, 306–307, 325–326
AddTextEntryStep method, 346–348
administrators on test teams, 8, 8
/all flag in dumpbin, 102
allFlags field, 189–191
alpha testers, 8, 8
Alt key, SendKeys code for, 335
APITextViewer class, 49–50, 52–53, 59. See also text viewer
APIUtility class, 53–57
Append method, 95
architecture
software, 176–179
testing tool, 212, 213
Arguments property
for non .NET applications, 415
in Process, 414
Array class, 161
ArrayList class, 161
arrow keys, SendKeys code for, 335
assemblies, loading, 164
AssertAlphanumericTest method
in GUITestVerification, 299–300
in TestExpectation, 289–291
AssertClipboardTest method
in GUITestVerification, 300
in TestExpectation, 289–291
AssertCosmeticGUITest method, 323–324
AssertRadioButtonCheckBox method, 357–358, 360
attributes
DIImport, 40–42, 47
in XML, 139
AutomatedGUITest project completed, 240–241
for data confirmation, 222–228, 223
data specification for, 247–252
GUI surveys in, 218–222, 245–247
interface for, 215–218, 217
labels for, 321–328, 322
for menus, 382–384, 386–387
for non .NET applications, 416–422, 416
for RadioButton and CheckBox controls, 355–363
starting applications in, 242–244
startup forms for, 213–215, 219, 301–305
tests in
automatic, 261–267, 262–264
general-purpose scripts for, 228–240
running, 252–261
for user-defined controls, 396–398
for verification. See verification
aximp.exe tool, 406–407, 407
back-end business functions in verification, 271–272
Backspace key, SendKeys code for, 335
base class for text viewer, 49–53
BasePriority property, 413
best practice verification, 276–277
Binary namespace, 150
binary serialization, 150–156, 156
BinaryDeSerialization method, 154–155
BinaryFormatter class, 150
BinarySerialization method, 153
binding, late, 167
for Add button, 168–170, 170
for front-end actions, 189–191
instructions for, 265–266
in OOP, 178
for TextBox controls, 342–344
bitmap comparisons, 21
bits for color, 86
bool data type, 43
Bottom property, 185
braces ({} for special characters, 334–335
Break key, SendKeys code for, 335
BringWindowToTop function, 115
btnAdd button, 77
btnAdd_Click event, 81–82
btnClear button, 77
btnClear_Click event, 83
btnCopy button, 77
btnCopy_Click event, 83
btnDeserialize_Click event
for binary serialization, 154
for SOAP serialization, 157–158
for XML serialization, 159–160
btnExit_Click event, 254–255, 261
btnGUISurvey_Click event
for command buttons, 195
for test library, 132–133
btnGUITest_Click event, 242, 256
for user-defined controls, 396–399
for verification, 304–305
btnGUITestScript_Click event, 196
btnStart_Click event, 90–91, 94, 96
btnStartApp_Click event
for command buttons, 195
for test library, 132–133
btnStartGUITest_Click event
in frmMain, 242, 256
for user-defined controls, 396–399
for verification, 304–305
btnStartScript_Click event, 196
btnStartStop_Click event, 133
btnVerifyScript_Click event, 196–197
btnView_Click event, 146–147
bugs, test monkeys for, 22
BuildVerificationList method, 292–294, 297–298, 302
business layer, 179–180
button controls
implementing, 194–197
in presentation layer, 180–181
C
C# programming, 38
characteristics of, 14–15
data type presentation in, 42–43
example, 43–47, 44, 47
Marshal class and DllImport attribute for, 41–42
PInvoke service for, 40–41
test monkeys for, 85
dumb, 85–92, 90, 92
smart, 92–97
text viewer. See text viewer
Cancel button, 225–226
Capacity property, 50
Caps Lock key, SendKeys code for, 335
captions for menus, 371
capture/playback
common features of, 29
in computer-assisted testing, 28
current, 20–22
reasons for, 38
as test requirement, 210
tools for, 11–12
chSize member, 110
cch member, 112
CCW (COM Callable Wrapper) proxy, 15
CenterMouseOn method, 114, 123–125, 129
char data type, 43
checkListMembersToVerify_SelectedIndexChanged method, 284, 287
CheckBox controls
  characteristics of, 354–355
  GUITestScript for, 358–363
  GUITestUtility for, 355–357
  TestExpectation for, 357–358
Checked property
  for CheckBox controls, 354
  for menus, 183
child windows, 115
className parameter in FindGUILike, 120
Clear button, verifying, 206, 206
click pathways, navigating, 375–376
Click property
  for buttons, 181
  for ComboBox controls, 182
  for Textbox controls, 184
clicking on menus, 377–380
ClickMenuItem method, 377–380
ClickMouse method
  for DLLs, 118
  for ListBox controls, 129
  in MouseAPI, 88, 92
Clipboard, verifying, 273
ClipBook Viewer, 202, 203
CLR (Common Language Runtime), 15
cmbAPITypes combobox, 77
cmbAPITypes_SelectedIndexChanged event, 79
COFF (Common Object File Format), 412
collecting label data, 328–329
Collections namespace, 49–50, 161–162
color
  bits for, 86
  for labels, 321
COM (Component Object Model), 178–179
COM apartments, 41
COM Callable Wrapper (CCW) proxy, 15
ComboBox controls, 181–182
command buttons, 194–197
command-line driven applications, 4
commercial testing tools, 28–31
Common Language Runtime (CLR), 15
Common Object File Format (COFF), 412
communication applications, verifying, 274
corporations, 25–26
compiler for MSIL, 412
CompleteDllImportCoding method, 64
Component Object Model (COM), 178–179
component-oriented programming (COP), 176–178
components
  custom. See user-defined controls
  sending keystrokes to, 346–349
  for user-defined control testing, 395
  verifying, 273
computer-assisted testing, 28–29
CompuWare TestPartner, 25
collections, FTP server, 337–339
consol applications, 44, 44
constants for DLLs, 114–115
ConstantViewer class, 57–60
constructors
  for GUISurveyClass, 219–220
  for GUITestScript, 230–231
  for GUITestVerification, 292
Control class, 185
controls
  ActiveX, 390
testing, 406–410, 407–410
  from Visual Studio 6, 393–394, 394
for AutomatedGUITest, 214–215
button, 180–181, 194–197
CheckBox. See CheckBox controls
ComboBox, 181–182
DialogBox, 182
for GUITestDataCollector, 277–278
label. See label controls
ListBox, 129
menus. See menus
RadioButton. See RadioButton controls
test script project for, 193–194
TextBox. See TextBox controls
for triggering events, 197–201
user-defined. See user-defined controls
ControlSerializer namespace, 152–156, 156
ControlTestBench class, 395–396
COP (component-oriented programming), 176–178
copy button, verifying, 205, 205
CopyMemory function, 60
cosmetic controls, 182, 320
  for AutomatedGUITest, 321–322, 322
  collecting data for, 328–329
  editing and rerunning data store for, 329–330
  GUITestActions for, 326–328
  GUITestScript for, 323–326
  for GUITestVerification, 323
Count method in APITextViewer, 52
Count property in Collections, 50–51
CreateInstance method, 169
CreateNavigator method, 145
CreateRectRgnIndirect function, 56
CSharpAPITextViewer class. See also text viewer code for, 45–53, 65–68, 72–75
GUI of, 75–84, 76–77
CTB class, 396
Ctrl key, SendKeys code for, 335
curly brackets ({}), for special characters, 334–335
current GUI testing infrastructure, 20
capture/playback, 20–22
intelligent automation, 24
test monkeys, 22–24
tools, 24–25
commercial, 28–31
Mercury Interactive, 26
open source, 27–28
Rational, 25–26
SilkTest, 27
TestPartner, 25
CurrentThread property, 171
custom controls. See user-defined controls
custom DLLs. See dynamic link libraries (DLLs)

data-driven test scripts, 33–34
data layer, 180
data types
in C#, 42–43
in COP, 178
exploring, 164–167, 167
database connectivity, 14
DDE (dynamic data exchange), 334
Debug class, 413
DeferWindowPos function, 115
DefineCShpStruct method, 69, 74
DefineCShpStructBody method, 70, 73–74
DefinitionList class, 50–51
Del key, SendKeys code for, 335
dependencies
platform, 7, 11
in user32.dll, 104–105, 104
Dependency Walker tool, 104–105, 104
deserialization. See serialization
Deserialization method, 150
DeSerializeInfo method in GUITestLibrary, 232
in GUITestUtility, 188–189
DeterminePreCheckedStatus method for RadioButton and CheckBox controls, 360, 363
for user-defined controls, 402–404
development life cycle for user-defined controls, 390
dgAvailableGUIs, CurrentCellChanged event error handling for, 383–384
in frmMain, 248–249, 258
dgAvailableGUIs_DoubleClick event in frmMain, 248–249, 251, 258–259
for keystrokes, 347–349
for verification, 301–302
Diagnostics namespace for non .NET applications, 413–414
for Process objects, 132, 337
DialogBox controls, 182
/disam flag in dumpbin, 102
DiscoverAllTypes method in GUITestDiscovery, 165–166
for threads, 172–173
DiscoveryByThread namespace, 172–173
display resolution, 87, 124
Dispose method, 195
divide-and-conquer approach, 211
Divide key, SendKeys code for, 336
DllImport attribute, 40–42, 47
DllImportViewer class, 60–68
DllMain function, 101
DLLs. See dynamic link libraries (DLLs)
double data type, 43
DoubleClick property, 181
Down arrow key, SendKeys code for, 335
DrawAnimatedRects function, 115, 127–128
DrawItem event, 183
dumb test monkeys for C#, 85–92, 90, 92
characteristics of, 23
dumpbin.exe command, 102–103, 103
dwItemData member, 112
dwTypeData member, 112
dynamic data exchange (DDE), 334
dynamic link libraries (DLLs), 38–40, 105–106
CenterMouseOn for, 123
constants for, 114–115
enumerations for, 113–114
FindGUILike for, 118–120
functions for, 116–118
GetDisplayResolution for, 123–124
GetGUIDataType for, 120–121
GetWindowFromPoint for, 126–127
GetWindowSize for, 126
HandleCommandButton for, 129
HandleListBox for, 128–129
HandleTextBox for, 129–130
IndicateSelectedGUI for, 127–128
MoveMouseInsideHwnd for, 124–126
ResetGUIInfo for, 121–123
Spy++ tool for, 106–107, 106–107
structures for, 108–113
SynchronizeWindow for, 130
test application, 130–135, 135
user32.dll for, 107–108

E
editing
  label data stores, 329–330
  recorded test scripts, 30
elapsed time for testing, 8
elements in XML, 139
Enabled property, 185
  for buttons, 181
  for labels, 321
  for menus, 183
capsulation, 177
End arrow key, SendKeys code for, 335
Enter key, SendKeys code for, 335
Enter method, 80
umerations for DLLs, 113–114
Equals method, 336
error handling
  in GUITestScript class, 398–404
  for menus, 383–386
ErrorDialog property, 414
Esc key, SendKeys code for, 335
EventLog class, 413
events
  triggering, 197–201
  visualizing outcomes, 201–202, 203
exception handling
  in GUITestScript class, 398–404
  for menus, 383–386
Exit menu for text viewer, 76
Exit method
  for btnExit_Click event, 255
  in Monitor, 80
  for text viewer, 78
expectations of automated testing, 6–7
ExpectedCosmeticsStr element, 329–330
/exports flag in dumpbin, 102
Extensible Markup Language. See XML programming

F
field verification, 272–273
file verification, 274
FileName property, 414–415
FillAPITypeComboBox method, 79
Finder tool, 106
FindGUILike method, 118–120, 122–123, 130, 371, 377
FindMembers method, 163
FindMembersToVerify method, 292–294, 297, 302
FindMenuClickPathByID method, 375–377, 379
FindMenuTextAndID method, 373–376, 379, 382
FindMenuWindow method, 377, 380
FindString method
  in CheckedListBox, 281
  for text viewer, 81
FindWindow function
  calling, 48, 56–57
  handles returned from, 118, 183
  in Win32API, 44, 46, 60
flexibility
  of testing tools, 7
  for upgrading, 11
float data type, 43
Flush method, 336, 338
fMask member, 110
Focused property, 185
Font property
  for labels, 321
  for TextBox controls, 184
Form1_Load event, 84
forms
  controls on
    button, 180–181
    ComboBox, 181–182
    command buttons, 194–197
    DialogBox, 182
    label, 182
    menu, 183
    TextBox, 184
  in GUI Test Library, 185–193
  resizing, 214
  startup, 213–216, 215
  test script project for, 193–194
  for verification, 301–305
visualizing event outcomes, 201–202, 203
Forms namespace, 288
frmMain class
  for AutomatedGUITest, 240–241
data specification for, 247–252
GUI surveys in, 245–247
running tests in, 252–261
starting applications in, 242–244
frmMain_Resize event, 254–255
front-end actions in verification, 271–272
fState member, 111
FTP server connections, 337–339
fType member, 110–111
functions for DLLs, 116–118
functions keys, SendKeys code for, 335–336

G
gdi32.dll DLL, 39
general-purpose test scripts, 228–240
General tab in Spy++, 106, 107
GetAGUIAction method, 187
GetByIndex method, 249
in Collections, 50–51
in SortedList, 379
GetChecke11Buttin1nGroup method
for CheckBox controls, 358–361
for user-defined controls, 402–403
GetClassName function
calling, 56–57
for controls, 122, 169
for smart test monkeys, 93–94
in Win32API, 44, 46–47, 340
GetConstructors method, 163
GetCSharpStyle method
in APITextViewer, 55–56
in APIUtility, 61–62
GetCSharpSyntax method, 51, 53
GetCursorPos function, 93–94, 126–127
GetData method, 171
GetDisplayResolution method, 123–124
GetDllName method, 61, 67–68
GetEvents method, 163
GetExpectedOutcome method, 295–296, 298–299
GetField method, 191
GetFields method, 163
GetFunctionReturnType method, 61, 68
GetFunctionStartPosition method, 82–83
GetGUIInfoType method, 120–121
GetHashCode method, 336
GetInterfaces method, 163
GetKey method
in APITextViewer, 52–53
in Collections, 50–51
for text viewer, 80
GetMembers method, 163, 166
GetMemberType method, 250–252, 260
GetMenu function, 118, 183, 369–370, 381
GetMenuItemCount method, 374
GetMenuInfo function, 110, 372, 374
GetMenuInfo1nRect function, 378
GetMenuString method, 374
GetMethod method, 163
GetMethod method, 163
GetNestedTypes method, 163
GetNextWindow function, 115
GetProperty method, 118
GetProperty method, 191
GetRidExtraSpaces method, 54–55, 60
GetSelectedMembers method, 294–295, 298
GetSelectedTypesUT method, 244, 257
GetSmartInfo method
in DLLs, 118
in MouseAPI, 93–95
GetSpecificVerifyMember method, 280, 285
GetSubMenu function, 309–370
GetSystemMetrics function, 87–89, 101, 115, 124
GetTopWindow function, 115
GetType method
for object types, 162–163, 169
in SendKeys, 336
GetType method, 166
GetTypeToTestFromAUT Method
in frmMain, 242–244, 256–257
for GUI surveys, 421–422
GetWindow function
constants for, 115
handles returned from, 120, 123
GetWindowFromPoint method, 126–127, 420
GetWindowRect function, 124, 128
GetWindowSize method, 126, 128, 218, 221
GetWindowText method
for captions, 93
for menus, 381, 385
for smart test monkeys, 94
for user-defined controls, 400
GroupBox controls
characteristics of, 354–355
verification, 325
GUI components verification, 273
GUI Survey button
for automatic testing, 263
for verification, 312
GUI surveys, 218–222, 245–247
GUI Test Data Collector form, 223, 223
for ActiveX controls, 408–410, 409–410
for automatic testing, 263, 264
controls and code for, 222–228
for menus, 387
for .NET controls, 405–406, 406
for non-.NET applications, 425, 425
for RadioButton controls, 364
GUI Test Library—HandleTextBox method

for TextBox controls, 344–346, 345, 350–351, 351
for user-defined controls, 404–405
for verification, 312–313, 313
GUI Test Library, 185–193
GUI Test Verification Class, 287
GUIControlProperties class, 151–152
deserializing objects in, 154–155
serializing objects in, 152–153
GUIInfo structure
  for test library, 191–192
  for TextBox controls, 340–341
GUIInfoCombo enumeration, 114
GUIInfoSerializable class, 192–193
GUIInfoType enumeration, 113
GUIList class, 347
GUINameTypeLists method, 250
GuiProperty field, 241
GUISurvey class, 241
GUISurveyClass class
  for automated testing, 245–247
  implementing, 218–222
  for menus, 381–382
guiSurveyCls class, 241, 421
GUITAR framework, 27
GUITDC field, 241
GUITestActionLib.xml document, 234
  for labels, 327
  for menus, 380–381
  for RadioButton and CheckBox controls, 355–356
  reading, 142
  for TextBox controls, 349
GUITestActions class, 108
  CenterMouseOn for, 123
  constants for, 114–115
  FindGUILike for, 118–120
  functions for, 116–118
  GetDisplayResolution for, 123–124
  GetGUIInfoType for, 120–121
  GetWindowFromPoint for, 126–127
  GetWindowSize for, 126
  HandleCommandButton for, 129
  HandleListBox for, 128–129
  HandleTextBox for, 129–130
  IndicateSelectedGUI for, 127–128
  for labels, 326–328
  for menus, 371–381
  MoveMouseInsideHwnd for, 124–126
  ResetGUIInfo for, 121–123
  structures for, 109
  SynchronizeWindow for, 130
  for TextBox controls, 341–342
GUITestDataCollector class, 241
  controls and code for, 222–228
  for verification, 277–287, 279
GUITestDiscovery namespace, 164–167
GUITestScript class, 229–230, 382
  constructors for, 230–231
  exception handling in, 398–404
  for labels, 323–326
  late binding in, 342–344
  listing, 236–240
  for menu clicks, 378–379
  for menus, 384–386
  for non .NET applications, 422–424
  for RadioButton and CheckBox controls, 358–363
  for TextBox controls, 342–344
  tick events for, 231–236
  for verification, 305–310
GUITestSeqList field, 241
GUITestUtility class, 241
  for non .NET applications, 431–432
  for RadioButton and CheckBox controls, 355–357
  for test library, 186–193
  for user-defined controls, 396
GUITestVerification class
  code for, 292–301
  for labels, 323
  for verification, 287–301
GW_CHILD value, 115, 120
GW_HWNDNEXT value, 115

H

Handle property
  for controls, 185
    in Process, 413
HandleAddButton method, 134
HandleCommandButton method
  code for, 129
    invoking dynamically, 168–170
    for RadioButton and CheckBox controls, 355
HandleCosmeticGUIs method, 327
HandleCount property, 413
HandleListBox method, 163
  code for, 128–129
    in GUITestActions, 134
HandleMenuItem method, 378–379
  handles for menus, 369
HandleTextBox method
  code for, 129–130
    for TextBox controls, 339
Label controls, 182, 320
for AutomatedGUITest, 321–322, 322
data collection for, 328–329
editing and rerunning data store for, 329–330
language independence—multithreaded programming

GUITestActions for, 326–328
GUITestScript for, 323–326
GUITestVerification for, 323
language independence, 11
late binding, 167
for Add button, 168–170, 170
for front-end actions, 189–191
instructions for, 265–266
in OOP, 178
for TextBox controls, 342–344
LateBindingGUIAction namespace, 168
Left arrow key, SendKeys code for, 335
Left property, 185
libraries, 100
building. See dynamic link libraries (DLLs)
dependencies in, 104–105, 104
user32.dll for, 100–103
ListBox controls, 129
Load method, 148
LoadFrom method, 166, 169
loading assemblies, 164
LoadLibrary function, 101
LoadRunner tool, 26
locating GUI components, 10
Location property, 321
long data type, 43
lump sum verification, 276

M

MachineName property, 414
main menus, 368
maintainability of scripts, 17, 211
MakeAllChecked method, 282–283, 286–287
MakeAParameter method, 61–62, 64, 67
MakeDataTableColumn method, 246–247, 258
management of testing, 7
management strategy, 9
manual testing, 9
Marshal class, 41–42
MarshalAsStringAttribute value, 71
MeasureItem event, 183
members, exploring, 164–167, 167
menu IDs, 370
menu windows, classes for, 371
MENUTEMINFO structure, 109–110
menus, 183, 368
AutomatedGUITest for, 382–384, 386–387
clicking on, 377–380
effect handling for, 383–386
example, 386–387
functions for, 372
GUITestActionLib.xml for, 380–381
GUITestActions for, 371
GUITestScript for, 384–386
handles for, 369
items for, 373–375
properties for, 369–371, 370
survey capability for, 381–384
testing, 368–369
Mercury Interactive Tools, 26
metadata for MSIL, 412
MethodInfo class, 163
MFS values, 111
MFT values, 110–111
mickey steps, 86–87
Microsoft Intermediate language (MSIL), 412
MIIM values, 110
munuFileExit_Click event, 78
munuFileOpen_Click event, 78
Monitor class, 80
monitor resolution, 87, 124
Monkey.ico icon, 415–416
MonkeyButtons enumeration, 87–88, 113–114
monkeys
for C#, 85
dumb, 85–92, 90, 92
smart, 92–97
current, 22–24
mouse_event function, 86–88, 90, 101
MOUSE_MICKEYS constant, 115
MouseAPI class
for dumb test monkeys, 85–92
for smart test monkeys, 92–97
MoveMouse method
for DLLs, 118
in MouseAPI, 89–90, 92
for test libraries, 126
MoveMouseInsideHwnd method
for automated testing, 221
for non .NET applications, 424
for test libraries, 114, 124–126
MoveToRoot method, 145
mscorlib.dll DLL, 41
MSIL (Microsoft Intermediate language), 412
MTAs (multithreaded apartments), 41
Multiply key, SendKeys code for, 336
multithreaded programming, 170–173

4351Book.fm  Page 439  Tuesday, September 28, 2004  11:21 AM
Name property—Properties dialog box

N

Name property, 171
namespaces, defining, 45
NavigateXMLDoc method, 145
navigating menu click pathways, 375–376
nesting in XML, 139
.NET controls
custom, 391–392, 392
testing, 404–406, 405–406
New Project dialog box, 43, 44
Next method, 91
non .NET applications, 412
Diagnostics for, 413–414
GUITestScript for, 422–424
GUITestUtility for, 414–415
starting, 413
testing, 424–426, 425
Num Lock key, SendKeys code for, 335
number verification, 273

O

object-oriented programming (OOP), 177–178
object serialization, 150
binary, 150–156, 156
helper classes for, 191–193
SOAP, 156–159, 158
XML, 159–161, 187–189
object verification, 274–276
OK button
GUITestDataCollector for, 225
verifying, 206
OOP (object-oriented programming), 177–178
Open menu for test viewer, 76
open source test tools, 27–28
OpenAPITextFile method, 78–79, 84
OpenXmlDoc method, 147–148
override keyword, 59

P

Page Down key, SendKeys code for, 335
Page Up key, SendKeys code for, 335
Parent property, 185
parentText parameter in FindGUILike, 120
ParseParameters method, 62–64, 66–67
ParseText method, 52–53
in ConstantViewer, 58–59
in DLLImportViewer, 64–66
overriding, 61
polymorphism with, 178
in StructViewer, 71–73
for text viewer, 79
passing strings, 55
pbProbe control, 416–418, 416
pbProbe_MouseDown event, 418–419
pbProbe_MouseMove event, 419–420
pbProbe_MouseUp event, 420
PE (portable executable) files, 412
PerformanceCounter class, 413
PictureBox controls, 416–418, 416
PInvoke service, 40–41
pixels, 86–87
PixelXYToMickeyXY method
in DLLs, 118
in MouseAPI, 88–89
platform independence, 7, 11
POINTAPI structure
in GUITestActions, 109
for text viewer, 92–93
polymorphism, 178
PopulateGUIInfo method
in GUITDC, 250
in GUITestDataCollector, 224, 227, 345–346
PopulateGUINameTypeLists method, 250–251, 259–260
Popup event, 183
portability of test scripts, 17
portable executable (PE) files, 412
position indexes for menus, 370
Pounder tool, 28
prechecked condition, 362
presentation layer controls, 179
button, 180–181
ComboBox, 181–182
DialogBox, 182
label, 182
menu, 183
TextBox, 184
Print Screen key, SendKeys code for, 335
Priority property, 171
Process class, 413
ProcessModule class, 413
programming languages, 13
C# See C# programming
XML. See XML programming
properties, verifying, 272–273
Properties dialog box, 106, 107
proposed testing approaches—SendWait method

proposed testing approaches, 31
  active, 31–32
  data-driven test scripts, 33–34
  generating testing data, 32–33

Q

qftestJUI tool, 28
Queue class, 161

R

RadioButton controls
  characteristics of, 354–355
  GUITestScript for, 358–363
  GUITestUtility for, 355–357
  TestExpectation for, 357–358
  testing, 364–365
random actions, test monkeys for, 22
Rational Robot, 25
Rational Software, 25
Rational test tools, 25–26
Rational Visual Test, 26
raw recorded scripts, limitations of, 247
rdJustEnough_CheckedChanged event, 283, 287
rdLumpsum_CheckedChanged event, 283, 287
rdSimple_CheckedChanged event, 282, 286
rdSpecific_CheckedChanged event, 275, 279–280
Read method, 142–143
readability of test scripts, 16
reading XML files, 142–144, 144
ReadLine method, 47, 59, 166
recorded scripts
  editing, 30
  limitations of, 247
RECT structure
  in GUITestActions, 109
  for StructViewer, 68–69
RectPosition enumeration, 113
RedirectStandardError property, 414
Reflection namespace, 164–167, 167
  regression testing, 7
  reusability for, 31
  as test requirement, 211
reliability of user-defined controls, 390
Remove button, verifying, 205, 206
Remove method, 50
Replace method, 55
reports
  of test results, 7
  XML documents for, 266–267, 310–311, 316–317, 317
requirements, 10, 210–212
ResetGUIInfo method, 121–123
resizing forms, 214
resolution, display, 87, 124
results, XML documents for, 266–267, 310–311, 316–317, 317
Resume method, 171
reusability
  for regression testing, 31
  as test requirement, 211
  of test scripts, 16, 29
  of user-defined controls, 391
RichTextBox controls, 184, 339
Right arrow key, SendKeys code for, 335
Right property, 185
Run Test button
  for automating tests, 252–253, 265
  for verification, 313
RunsScript method
  for menus, 384–385
  for RadioButton and CheckBox controls, 360, 362–363
  for TextBox controls, 343
  for timer controls, 233–235, 238–239
  for user-defined controls, 399–400
runtime type discovery, 164

S

SaveSmartMonkeyKnowledge method, 96
schemas in XML, 139
scripts. See test scripts
Scroll Lock key, SendKeys code for, 335
Segue SilkTest, 27
Select event, 183
SelectedIndexChanged event
  for ComboBox controls, 182
  in GUITestDataCollector, 284
SelectedText property, 184
semi-automatic script verification, 203–206, 204–206
Send method, 336–337
sending keystrokes to components, 346–349
SendKeys class, 334
  for FTP server connections, 337–339
  methods of, 336–337
  special keys for, 334–336
SendMessage function, 114
SendWait method, 336–337, 339
serialization, 150–151
  binary, 150–156, 156
  helper classes for, 191–193
  SOAP, 156–159, 158
  XML, 159–161, 187–189
Serialization namespace, 186
Serialize method, 150
SerializeInfo method
  for btnRunTest_Click event, 254
  in GUITestUtility, 188
SetData method, 171
SetGUIListToTest method
  in frmMain, 258
  for GUI surveys, 246
SetMenuTextInfo function, 110
SetRect function, 128
SetSimpleVerification method, 281, 285–286
SetWindowPos function, 115
SetWindowText function, 118, 371
SGML (Standard Generalized Markup Language), 138
shared behaviors, 49
shared test scripts, 211
shell32.dll DLL, 39
Shift key, SendKeys code for, 335
short data type, 43
Show method, 190, 397
ShowDialog method
  for AutomatedGUITest, 244
  for button clicks, 217
  for XML documents, 147
SilkTest, 27
Simple Object Access Protocol (SOAP) serialization, 156–159, 158
SimulateFTPConn namespace, 338
single-threaded apartments (STAs), 41
size
  of forms, 214
  of labels, 320
Size property, 320
Sleep method
  for text viewer, 79
  in Thread, 171
SM_CXSCREEN constant, 115
SM_CYSCREEN constant, 115
smart monkeys, 23, 92–97
Soap namespace, 156
SOAP (Simple Object Access Protocol) serialization, 156–159, 158
SoapDeSerialization method, 156–157
SoapSerialization method, 156–157
software architecture, 176–179
  business layer, 179–180
  data layer, 180
  presentation layer, 179
Sorted property, 181
SortedList class, 50, 161, 221
special keys with SendKeys, 334–336
Split method, 55, 296
Spy++ tool, 106–107, 106–107
Stack class, 161
Standard Generalized Markup Language (SGML), 138
StandardError property, 414
Start GUI Test button, 312
Start method
  in Process, 413
  in Thread, 171
  in TypeDiscThread, 172
StartAUT method
  in GUITestScript, 231–232, 237–238
  in GUITestUtility, 243
  for late binding, 189–190
  for non .NET applications, 414, 423–424
  for user-defined controls, 396, 398
StartAUTAsProcess method, 415, 422
StartControlUT method, 396
StartGUISurvey method
  for automated testing, 245
  for child components, 218
  code for, 220–221
  for menus, 381, 383
  for non .NET applications, 421
StartInfo property
  for non .NET applications, 415
  in Process, 414
starting applications
  in AutomatedGUITest, 242–244
  non .NET, 413
StartMenuSurvey method
  for menus, 381–383
  for non .NET applications, 421
StartNonDotNetAUT method, 422–423
StartNonDotNetSurvey method, 420–421
startup forms
  application, 215–216
  AutomatedGUITest project, 213–215, 215
  for verification, 301–305
STAs (single-threaded apartments), 41
StreamWriter class, 188
StringBuilder class, 156–159, 158
StringBuilder type—TextBox controls

StringBuilder type, 56–57
strings
data type, 43
passing, 55
structures, 108–113, 192
StructViewer class, 68–75
submenus, 368–371
Subtract key, SendKeys code for, 336
/summary flag in dumpbin, 102
surveys
in automated testing, 218–222, 245–247
for menus, 381–384
Suspend method, 171
SynchronizeWindow method, 130, 232–233
syntax in XML, 139
System.Array class, 161
System.Collections namespace, 49–50, 161–162
System.Diagnostics namespace
for non-.NET applications, 413–414
for Process objects, 132, 337
System.IO namespace, 186
System namespace, 45
System.Reflection namespace,
164–167, 167
System.Runtime.InteropServices namespace, 40–41, 45, 108
namespace, 150
System.StringBuilder type, 56–57
system testing as test requirement, 211
System.Text namespace, 45, 186
System.Threading namespace,
170–173
System.Type class, 162–164
System.WinForms.Forms namespace, 288
System.WinForms.Forms.RichTextBox class, 339
System.Xml.Serialization namespace, 186
System.Xml.XmlTextWriter class, 140
System.Xml.XPath namespace, 145
test monkeys
for C#, 85
dumb, 85–92, 90, 92
smart, 92–97
current, 22–24
test playbacks, 12
test requirements, 210–212
Test Script Language (TSL), 26
test scripts, 10, 16–17
data-driven, 33–34
editing, 30
languages for, 7, 12–15, 248
limitations of, 247
verifying, 203–206, 204–206
test teams, 8–9, 8
testability hooks, 30–31
TestExpectation class
for RadioButton and CheckBox controls, 357–358
for verification, 288–290
testing bench, 395–397
testing data, generating, 32–33
testing time for user-defined controls, 391
TestPartner, 25
Text namespace, 45, 186
Text property
for buttons, 181
for ComboBox controls, 181
for labels, 321
for menus, 183
for TextBox controls, 184
test verification, 273
text viewer, 48–49, 135, 193
base class for, 49–53
ConstantViewer for, 57–60
DllImportViewer for, 60–68
GUID of, 75–84, 76–77
launching, 134–135, 135
for RadioButton controls, 364–365
StructViewer for, 68–75
for TextBox controls, 350–351, 351
utility class for, 53–57
for verification, 312
TextBox controls, 184, 334
GUIDInfo for, 340–341
GUITestActions for, 341–342
in GUITestDataCollector, 344–346, 345
GUITestScript for, 342–344
SendKeys for, 334–339
testing, 339
text viewer for, 350–351, 351
TextChanged property  
for buttons, 181  
for ComboBox controls, 182  
for TextBox controls, 184  
TextLength property, 184  
Thread class, 170–173  
Threading namespace, 170–173  
ThreadPool class, 170  
ThreadState property, 171  
tick events  
for DLLs, 133–134  
for GUITestScript, 231–240  
for non .NET applications, 423–424  
for verification, 305–306  
Timer class, 170–171  
timer controls  
in GUITestScript, 229–230  
for triggering events, 197–201  
timer1_Tick event, 197–199  
timer2_Tick event, 199–201  
tmrAddDefinition_Tick event, 133–134  
tmrAutomatedTest_Tick event  
in GUITestScript, 231–232, 237  
for non .NET applications, 423–424  
for verification, 305–306  
tmrMonkey_Tick event, 91, 94–95  
tmrRunScript_Tick event, 233–234, 238  
tmrStopScript_Tick event  
in GUITestScript, 235, 239  
for verification, 306  
tmrVerifyTest_Tick event  
in GUITestScript, 236, 239–240  
for verification, 309–310  
tool vendors, 24–25  
Top property, 185  
topmost windows, 115  
ToString method, 336  
traditional applications, 412  
Diagnostics for, 413–414  
GUITestScript for, 422–424  
GUITestUtility for, 414–415  
starting, 413  
testing, 424–426, 425  
TreeView control, 149, 149  
triggering events, 197–201  
Trim method, 281  
try-catch blocks  
for menus, 383–386  
for user-defined controls, 398–404  
TSL (Test Script Language), 26  
txtLookFor TextBox, 77  
txtLookfor_TextChanged event, 81  
Type class, 162–164  
TypeDiscThread class, 172  
types  
in C#, 42–43  
in COP, 178  
exploring, 164–167, 167  
Types under Test form, 217, 217, 262, 263  
TypeUnderTest class, 216  
TypeVerification class, 291  
TypeVerificationSerializable class, 291–292  
uint data type, 43  
ulong data type, 43  
UML (Unified Modeling Language), 3  
unboxing technique, 200  
Unicode characters, 42  
Unified Modeling Language (UML), 3  
unsigned data types, 43  
Up arrow key, SendKeys code for, 335  
UpdateConstants method, 80  
UpdateDllImports method, 80  
UpdateStructs method, 80–81  
upgradability as test requirement, 212  
upgrading, flexibility for, 11  
user-defined controls, 390–391  
AutomatedGUITest for, 396–398  
components for, 395  
extension handling for, 398–404  
GUITestUtility for, 396  
testing bench for, 395–397  
user interest in verification, 273–274  
user32.dll DLL, 39, 48, 100–101  
for building DLLs, 107–108  
dependencies in, 104–105, 104  
dumpbin.exe for, 102–103, 103  
user32Imported.txt file, 103  
UseShellExecute execute file, 103  
UTF8 format, 187  
utility class, 53–57
Values property, 50
verification
automated, 274–275
best practice, 276–277
of changes, 272–273
front-end actions and back-end business functions in, 271–272
fully automated test for, 312–317
GUITestDataCollector for, 277–287
GUITestScript for, 305–310
GUITestVerification for, 287–301
lump sum, 276
of objects, 274–276
requirements, 270–271
semi-automatic test scripts for, 203–206
startup form for, 301–305
as test requirement, 210
user interest in, 273–274
XML document viewer for, 310–311, 316–317, 317
VerifyAlphanumericResult method, 308
VerifyCheckedValue method, 359–361
VerifyClipboard method, 308–309
VerifyCosmeticGUIs method, 324
VerifyField method
for RadioButton and CheckBox controls, 355–357, 359
for test library, 190, 252
for verification, 307
VerifyGroupBox method, 325
VerifyLabel method, 325
VerifyProperty method
for test library, 191, 252
for verification, 307
VerifyRadioButtonCheckBox method, 361–362
Visible property, 185
for buttons, 181
for labels, 321
for menus, 183
Visual Studio 6, ActiveX components from, 393–394, 394
visualizing event outcomes, 201–202, 203

Win32API.txt file, 40, 48–49, 52, 54, 57
window handles, 369
WindowClassDiscovery namespace, 44–47
WindowFromPoint function, 93–94, 127
WindowStyle property, 415
windowText parameter in FindGUIlike, 119
WinRunner tool, 26
WM_GETTEXT constant, 114–115
WM_GETTEXTLENGTH constant, 115
WriteChildElement method, 141–142
WriteEndElement method, 141–142
WriteLine method, 145
WriteStartElement method, 141
writing XML files, 139–142

XML data store, 265–266
XML documents
for test results, 266–267
for verification results, 310–311, 316–317, 317
XML programming, 138–139
accessibility in, 187–189
C# support for, 14
reading files in, 142–144, 144
serialization in, 159–161, 187–189
writing files in, 139–142
XmlDocument for, 146–150, 149
XPathNavigator for, 144–146
XMLCreator namespace, 140
XMLDeSerialization method, 159
XmlDocument class, 146–150, 149
XMLExtractor namespace, 143
XMLGuiTestActions class, 140–141
XmlNavigator namespace, 144–146
xmlnotepad.html file, 139
XMLRecursion method, 148–149
XMLSerialization method, 159
XmlTestReader class, 143–144
XmlTextWriter class, 140
XmlTreeViewer project, 311, 316
XPath namespace, 14, 145
XPathDocument class, 145
XPathNavigator class, 144–146

Z

Z order, 115