

オブジェクト指向プログラミング入門（その2）

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「オブジェクトの実態をながめましょう」

“ABC” はどんなオブジェクトでしょうか？

irb を使って調べてみましょう。

irb とは、interactive ruby の略で、ruby をインストールすると、標準で付属しています。

irb の起動は ruby を実行できる場所で irb と入力すれば動作して下記のように irb の入力待ちモードになります。

```
C:¥>irb
```

```
irb(main):001:0>
```

さて、“ABC”のクラスは String 文字列を扱うクラスですね。

では String クラスのスーパークラスは何でしょうか？

Object クラスですね。そう、すべては Object クラスからはじまります。下記のように入力して確かめてください。（赤で表示したのは特に意味はありませんが、キーインしていることを単に強調するためです）

```
C:¥>irb
```

```
irb(main):001:0> a = "ABC"
```

```
=> "ABC"
```

```
irb(main):002:0> a.class
```

```
=> String
```

```
irb(main):003:0> String.superclass
```

```
=> Object
```

```
irb(main):004:0> Object.superclass
```

```
=> nil
```

```
irb(main):005:0>
```

メソッドを調べてみましょう

```
irb(main):008:0> a.protected_methods
```

```
=> []
```

```
irb(main):009:0> a.private_methods
```

```
=> ["rand", "load", "initialize", "proc", "fail", "printf", "String", "exec", "s
```

```
printf", "iterator?", "catch", "readline", "require", "callcc", "lambda", "fork",
, "caller", "print", "Array", "format", "readlines", "block_given?", "throw", "D
elegateClass", "warn", "loop", "getc", "autoload", "trap", "exit!", "singleton_m
ethod_added", "initialize_copy", "exit", "putc", "system", "trace_var", "global_
variables", "p", "remove_instance_variable", "`", "syscall", "Integer", "test",
"singleton_method_removed", "abort", "puts", "sleep", "irb_binding", "eval", "un
trace_var", "local_variables", "srand", "autoload?", "binding", "open", "raise",
"Float", "method_missing", "singleton_method_undefined", "gets", "at_exit", "se
t_trace_func"]
```

```
irb(main):010:0> a.public_methods
```

```
=> ["send", "%", "rindex", "between?", "reject", "[]=", "split", "<<", "object_i
d", "strip", "size", "singleton_methods", "downcase", "gsub!", "count", "succ!",
"__send__", "downcase!", "intern", "member?", "squeeze!", "equal?", "taint", "*"
, "next", "find", "frozen?", "instance_variable_get", "each_with_index", "rstri
p!", "each_line", "+", "kind_of?", "sub", "slice!", "instance_eval", "to_a", "tr
", "replace", "collect", "reverse", "all?", "type", "entries", "lstrip", "protec
ted_methods", "capitalize", "chop!", "extend", "capitalize!", "scan", "to_sym",
"detect", "eql?", "instance_variable_set", "zip", "each_byte", "is_a?", "casecmp
", "hash", "gsub", "empty?", "to_str", "map", "to_s", "tr_s", "any?", "tr!", "cl
ass", "match", "sort", "rstrip", "tainted?", "private_methods", "next!", "swapca
se", "min", "chomp!", "swapcase!", "ljust", "untaint", "find_all", "upto", "hex"
, "each", "sum", "id", "reverse!", "chop", "to_i", "insert", "<", "inject", "<=>
", "inspect", "delete", "dump", "==" , "tr_s!", "unpack", ">", "concat", "===", "
clone", "succ", "sort_by", "public_methods", "strip!", "max", "rjust", ">=", "re
spond_to?", "display", "freeze", "index", "select", "<=", "slice", "oct", "__id_
_", "to_f", "length", "chomp", "methods", "upcase", "partition", "=~", "sub!", "
squeeze", "method", "upcase!", "crypt", "delete!", "nil?", "dup", "grep", "insta
nce_variables", "lstrip!", "include?", "instance_of?", "center", "[]"]
```

```
irb(main):011:0>
```

Object はどんなメソッドをもっているのでしょうか？

```
irb(main):018:0> Object.methods
```

```
=> ["send", "name", "class_eval", "object_id", "new", "singleton_methods", "__se
nd__", "private_method_defined?", "equal?", "taint", "frozen?", "instance_variab
le_get", "constants", "kind_of?", "to_a", "instance_eval", "ancestors", "const_m
issing", "type", "instance_methods", "protected_methods", "extend", "protected_m
```

```

method_defined?", "eql?", "public_class_method", "const_get", "instance_variable_
set", "hash", "is_a?", "autoload", "to_s", "class_variables", "class", "tainted?
", "private_methods", "public_instance_methods", "instance_method", "untaint", "
included_modules", "private_class_method", "const_set", "id", "<", "inspect", "<
=>", "==" , "method_defined?", ">", "===", "clone", "public_methods", "protected_
instance_methods", ">=", "respond_to?", "display", "freeze", "<=", "module_eval"
, "autoload?", "allocate", "__id__", "=~", "methods", "method", "public_method_d
efined?", "superclass", "nil?", "dup", "private_instance_methods", "instance_var
iables", "include?", "const_defined?", "instance_of?"]
irb(main):019:0>

```

どうやら Object は共通的な色々なメソッドを持っていますね。
 再び Object にあるいくつかのメソッドを使ってみましょう。

```

irb(main):019:0> a.object_id
=> 23042828
irb(main):020:0> a.id
=> 23042828
irb(main):021:0> a.display
ABC=> nil
irb(main):022:0> a.type
(irb):22: warning: Object#type is deprecated; use Object#class
=> String
irb(main):023:0> a.class
=> String
irb(main):024:0>

```

それではクラスを作ってみましょう。

```

irb(main):024:0> class PersonBase
irb(main):025:1>   def initialize(name, age)
irb(main):026:2>     @name = name
irb(main):027:2>     @age = age
irb(main):028:2>   end
irb(main):029:1>   def name
irb(main):030:2>     @name
irb(main):031:2>   end
irb(main):032:1>   def age

```

```
irb(main):033:2> @age
irb(main):034:2> end
irb(main):035:1> def setAge(age)
irb(main):036:2> @age = age
irb(main):037:2> end
irb(main):038:1> end
⇒ nil
```

このクラスから `new` によってインスタンスを発生させてみます。

```
irb(main):039:0> fuku = PersonBase.new("Fukuhara", 16)
⇒ #<PersonBase:0x2aa4d58 @age=16, @name="Fukuhara">
このインスタンスのクラスを確認してみましょう。当然 PersonBase クラスです。
irb(main):040:0> fuku.class
⇒ PersonBase
```

では `PersonBase` のスーパークラスは何でしょうか？ そう、`Object` なのです。

```
irb(main):041:0> PersonBase.superclass
=> Object
irb(main):042:0>
```

では `fuku` インスタンスはどんなメソッドを使うことができるのでしょうか？

メソッド `name` `age` `setAge` は `PersonBase` クラスで定義したので当然ですね。その他に `Object` から継承して色々なメソッドが使えることが分かります。

```
irb(main):042:0> fuku.methods
=> ["send", "name", "age", "object_id", "singleton_methods", "__send__", "equal?",
", "taint", "frozen?", "instance_variable_get", "kind_of?", "to_a", "instance_eval",
"type", "protected_methods", "extend", "eql?", "instance_variable_set", "hash",
"is_a?", "to_s", "setAge", "class", "tainted?", "private_methods", "untaint",
"id", "inspect", "==", "===", "clone", "public_methods", "respond_to?", "display",
"freeze", "__id__", "=~", "methods", "method", "nil?", "dup", "instance_variables",
"instance_of?"]
irb(main):043:0>
```

irb の load の使い方 :

フォルダ C:¥rubytest にある human1.rb を irb で動かしたい場合には下記のようにします。なお、漢字を使うためには -Ks を付けて起動してください。(シフト JIS を指定したことになります)

```
C:¥rubytest>irb -Ks
irb(main):001:0> load "human1.rb"
#<Human:0x2c02058 @name="小泉純一郎", @age=62>
#<Human:0x2c02028 @name="清原和博", @age=37>
#<Human:0x2c01ff8 @name="斎藤由貴", @age=38>
#<Human:0x2c01fc8 @name="高倉健", @age=73>
#<Human:0x2c01f80 @name="福原愛", @age=17>
=> true
irb(main):002:0> batsubei = Human.new("ルアタンギ・バツベイ", 27)
=> #<Human:0x2bfb650 @name="ルアタンギ・バツベイ", @age=27>
irb(main):003:0>
```

「色々なところで使われているオブジェクトの実例を知る」

あなたのパソコンの中にはオブジェクト指向に適合するプログラムがいっぱい入っています。マイクロソフト社の **Office** や **InternetExplorer** も実はオブジェクト指向に適合するプログラムなんです。それでは次のプログラム **ole.rb** を実行してみてください。
C:\¥rubytest にプログラム **ole.rb** と出力テキストファイル **test.txt** を置いているとしています。

C:\¥rubytest>ruby -Ks ole.rb をコマンドプロンプトから入力することで起動します。
(**-Ks** は漢字コードが **Windows** 標準のシフト **JIS** であることを示しています)

<ole.rb プログラムの内容>

```
require 'win32ole'
$stdout = File.open("test.txt", 'w')
# あなたのパソコンで利用可能な ProgID の一覧を stdout に出力する
ary = WIN32OLE_TYPE.progids
ary.sort!
puts "あなたのパソコンで利用可能な ProgID の一覧です " + "個数は #{ary.length}あります"
puts " "
p ary
```

結果は次ページのようにになります。(内容は各自のパソコンにより異なりますが、ほぼ同様でしょう)

ここで一つ一つの **ProgID** はオブジェクトを示す名称です。例えば **Excel.Application** とか

InternetExplorer.Application といったお馴染みの名前があるはずですが。

私の自席のパソコンの場合 **3060** 個のオブジェクトがありました。このようにたくさんのオブジェクトが使われている、あるいは使うことができるということがお判りになったでしょう。このようにオブジェクト指向とは決して特殊なものではなく、今まさに大いに使われている技術なのです。

実行結果を以下に示します。

あなたのパソコンで利用可能な ProgID の一覧です 個数は 3060 あります

[", "ACCWIZ.FieldListCtrl.1", "ACCWIZ.FieldListCtrl.1.8", "ACCWIZ.ImexGridCtrl.1",
"ACCWIZ.ImexGridCtrl.1.8", "ADCCtl.ADCctl", "ADCCtl.ADCctl.1",
"ADOCConnectObject.ADOCConnectObject", "ADOCConnectObject.ADOCConnectObject.1",
"ADODB.Command", "ADODB.Command.2.5", "ADODB.Connection", "ADODB.Connection.2.5",
"ADODB.Error", "ADODB.Error.2.5", "ADODB.ErrorLookup", "ADODB.ErrorLookup.2.5",
"ADODB.Parameter", "ADODB.Parameter.2.5", "ADODB.Record", "ADODB.Record.2.5",
"ADODB.Recordset", "ADODB.Recordset.2.5", "ADODB.Stream", "ADODB.Stream.2.5",
"ADOMD.Catalog", "ADOMD.Catalog.2.5", "ADOMD.Cellset", "ADOMD.Cellset.2.5",
"ADOX.Catalog.2.5", "ADOX.Catalog.2.5", "ADOX.Column.2.5", "ADOX.Column.2.5", "ADOX.Group.2.5",
"ADOX.Group.2.5", "ADOX.Index.2.5", "ADOX.Index.2.5", "ADOX.Key.2.5", "ADOX.Key.2.5",
"ADOX.Table.2.5", "ADOX.Table.2.5", "ADOX.User.2.5", "ADOX.User.2.5", "ADS.Connector.1",
"ADS.Connector.1", "ADSystemInfo", "ADs", "ADsDSOObject", "ADsNamespaces",
"AMOVIE.ActiveMovieControl", "AMOVIE.ActiveMovieControl.2", "AMtoolbar.AMtoolbar",
"AMtoolbar.AMtoolbar.1", "ASControls.InstallEngineCtl", "ASControls.InstallEngineCtl.1",
"ASFChopper.ASFChopper", "ASFChopper.ASFChopper.1", "ASFSession.ASFSession",
"ASFSession.ASFSession.1", "ASFSessionProp.ASFSessionProp", "ASFSessionProp.ASFSessionProp.1",
"ASP.HostEncode", "ATL.Registrar", "AVGeneralNotification.AVGeneralNotification",
"AVGeneralNotification.AVGeneralNotification.1", "AVIFile", "AVTapi.AVTapi", "AVTapi.AVTapi.1",
"Access.Application.9", "Access.OLE2Link", "AccessControlEntry", "AccessControlList",
"AcroAccess.AcroAccess", "AcroAccess.AcroAccess.1", "AcroExch.Document",
"AcroIEHelper.AcroIEHlprObj", "AcroIEHelper.AcroIEHlprObj.1", "ActiveTabs.SSTabPanel",
"ActiveTabs.SSTabPanel.2", "ActiveTabs.SSTabs", "ActiveTabs.SSTabs.2",
"Adaptec.EasyCDACMWrapper", "Adaptec.EasyCDACMWrapper.2", "Adaptec.EasyCDDevice",
"Adaptec.EasyCDDevice.1", "Adaptec.EasyCDDrive", "Adaptec.EasyCDDrive.1",
"Adaptec.EasyCDEngine", "Adaptec.EasyCDEngine.1", "Adaptec.EasyCDMusicDatabase",
"Adaptec.EasyCDMusicDatabase.1", "Adaptec.EasyCDPlayer", "Adaptec.EasyCDPlayer.1",
"Adobe.SVGCtl", "Adobe.SVGCtl.2", "Agent.Control", "Agent.Control", "Agent.Control.1",
"Agent.Control.2", "Agent.Server", "Agent.Server.2", "AppExport.AppExport", "AppExport.AppExport.1",
"AppImport.AppImport", "AppImport.AppImport.1", "AppManager", "AppManager", "AppManager.1",
"AppManager.1", "AppidData.AppidData", "AppidData.AppidData.1", "Asf.RealTimeEncoder",
"AspParser.AspParser", "AspParser.AspParser.1", "AspView.AspView", "AspView.AspView.1", "Attr.Attr",
"Attr.Attr.2", "AutomatableDBConnectObject.AutomatableDBConnectObject",

"AutomatableDBConnectObject.AutomatableDBConnectObject.1", "BARCODE.BarCodeCtrl",
"BARCODE.BarCodeCtrl.1", "BR549.Br549Ctrl.1", "BackLink",
"Behavior.Microsoft.DXTFilterBehavior", "Behavior.Microsoft.DXTFilterBehavior.1",
"BehaviorFactory.Microsoft.DXTFilterFactory",

3～9ページの出力は省略した

"DispatchMapper.DispatchMapper.1", "Document.Document", "Document.Document.2",
"DocumentFragment.DocumentFragment", "DocumentFragment.DocumentFragment.2",
"DocumentType.DocumentType", "DocumentType.DocumentType.2", "Download.DownloadCtl",
"Download.ItemSelectCtl", "Download.ItiranCtl", "Download.JyoukenSaveCtl",
"Download.JyoukenSetCtl", "Download.hat_download", "DownloadBehavior.DownloadBehavior",
"DownloadBehavior.DownloadBehavior.1", "EXCIOL.URL", "EXCIOL.URL.1",
"EapMschapv2Cfg.EapMschapv2Cfg", "EapMschapv2Cfg.EapMschapv2Cfg.1", "EapTlsCfg.EapTlsCfg",
"EapTlsCfg.EapTlsCfg.1", "ElasticCtl.ElasticCtl", "ElasticCtl.ElasticCtl.1", "Element.Element",
"Element.Element.2", "Email", "EndpointsTable.EndpointsTable", "EndpointsTable.EndpointsTable.1",
"Entity.Entity", "Entity.Entity.2", "EntityReference.EntityReference",
"EntityReference.EntityReference.2", "Equation", "Equation.2", "Equation.3", "Equations",
"EventPublisher.EventPublisher.1", "EventSystem.EventClass", "EventSystem.EventClass.1",
"EventSystem.EventPublisher", "EventSystem.EventPublisher.1", "EventSystem.EventSubscription",
"EventSystem.EventSubscription.1", "EventSystem.EventSystem", "EventSystem.EventSystem.1",
"Excel.Application", "Excel.Application.9", "Excel.Chart", "Excel.Chart.5", "Excel.Chart.8",
"Excel.Sheet", "Excel.Sheet.5", "Excel.Sheet.8", "ExcelChart", "ExcelMacrosheet", "ExcelWorksheet",
"FDE", "FDE.1", "FDate.Factoid", "FDate.Factoid.2", "FILEMGMT.FileSvcMgmtAboutObject.1",
"FILEMGMT.FileSvcMgmtAboutObject.1", "FILEMGMT.FileSvcMgmtExtObject.1",
"FILEMGMT.FileSvcMgmtExtObject.1", "FILEMGMT.FileSvcMgmtObject.1",
"FILEMGMT.FileSvcMgmtObject.1", "FName.Factoid", "FName.Factoid.2", "FPSpread.Spread.1",
"FPSpread.Spread.2", "FPerson.Factoid", "FPerson.Factoid.2", "FTSSession.FTSSession",
"FTSSession.FTSSession.1", "FTSSessionProp.FTSSessionProp", "FTSSessionProp.FTSSessionProp.1",
"FX.Rowset", "FX.Rowset", "FX.Rowset.1", "FX.Rowset.1", "FaxNumber", "FaxServer.FaxServer",
"FaxServer.FaxServer.1", "FaxSnapin.FaxSnapin", "FaxSnapin.FaxSnapin", "FaxSnapin.FaxSnapin.1",
"FaxSnapinAbout.FaxSnapinAbout.1", "FaxTiff.FaxTiff", "FaxTiff.FaxTiff.1",
"FlashFactory.FlashFactory", "FlashFactory.FlashFactory.1", "Forms.CheckBox.1",
"Forms.ComboBox.1", "Forms.CommandButton.1", "Forms.Form.1", "Forms.Frame.1",
"Forms.HTML:Checkbox.1", "Forms.HTML:Hidden.1", "Forms.HTML:Image.1",
"Forms.HTML:Option.1", "Forms.HTML:Password.1", "Forms.HTML:Reset.1", "Forms.HTML:Select.1",
"Forms.HTML:Submitbutton.1", "Forms.HTML:Text.1", "Forms.HTML:TextArea.1", "Forms.Image.1",

"Forms.Label.1", "Forms.ListBox.1", "Forms.MultiPage.1", "Forms.OptionButton.1",
 "Forms.ScrollBar.1", "Forms.SpinButton.1", "Forms.TabStrip.1", "Forms.TextBox.1",
 "Forms.ToggleButton.1", "GihaPrint.GihaIraiMailCtl", "H323MSP.H323MSP", "H323MSP.H323MSP.1",
 "HEADER.HeaderControl.1", "HHCtrl.FileFinder", "HHCtrl.FileFinder.1", "HHCtrl.SystemSort",
 "HHCtrl.SystemSort.666", "HTML.HostEncode", "HTMLInlineSoundCtl.1", "HTMLInlineVideoCtl.1",
 "HWXInk.E-Ink", "HWXInk.E-Ink.1", "HakouMemo.HakouMemoCtl", "Hatuban.HatubanCtl",
 "Hatuban.HatubanCtl2", "Hatuban.HatubanHeadCtl", "Hatuban.HatubanHeadCtl2",
 "Hatuban.HatubanItemCtl", "Hatuban.HatubanItemCtl2", "Hatuban2.HatubanCmb",
 "Hatuban2.HatubanCmb", "Hatuban2.HatubanCtl", "Hatuban2.HatubanCtl",
 "Hatuban2.HatubanHeadCtl", "Hatuban2.HatubanHeadCtl", "Hatuban2.HatubanHeadCtl2",
 "Hatuban2.HatubanHeadCtl2", "Hatuban2.HatubanHeadHenCtl", "Hatuban2.HatubanHeadHenCtl",
 "Hatuban2.HatubanHeadPlusCtl", "Hatuban2.HatubanHeadPlusCtl", "Hatuban2.HatubanItemCtl",
 "Hatuban2.HatubanItemCtl", "Hatuban2.HatubanItemCtl2", "Hatuban2.HatubanItemCtl2",
 "HeaderFooter.HeaderFooter", "HeaderFooter.HeaderFooter.1", "Hold", "HomePage.HomePage",
 "HomePage.HomePage.1", "HtmDocData.HtmDocData", "HtmDocData.HtmDocData.1",
 "HtmEditorFactory.HtmEditorFactory", "HtmEditorFactory.HtmEditorFactory.1",
 "HtmLanguageService.HtmLanguageService", "HtmLanguageService.HtmLanguageService.1",
 "HtmlDlgHelper.HtmlDlgHelper", "HtmlDlgHelper.HtmlDlgHelper.1",
 "HtmlDlgSafeHelper.HtmlDlgSafeHelper", "HtmlDlgSafeHelper.HtmlDlgSafeHelper.1",
 "IAS.ADsDataStore", "IAS.ADsDataStore.1", "IAS.Accounting", "IAS.Accounting.1", "IAS.Attribute",
 "IAS.Attribute.1", "IAS.AuditChannel", "IAS.AuditChannel.1", "IAS.AuthorizationHost",
 "IAS.AuthorizationHost.1", "IAS.BaseCampHost", "IAS.BaseCampHost.1", "IAS.CClient",
 "IAS.CClient.1", "IAS.ChangePassword", "IAS.ChangePassword.1", "IAS.DataStoreMdb",
 "IAS.DataStoreMdb.1", "IAS.Dictionary", "IAS.Dictionary.1", "IAS.EAP", "IAS.EAP.1",
 "IAS.IasDataSource", "IAS.IasDataSource.1", "IAS.IasHelper", "IAS.IasHelper.1", "IAS.InfoBase",
 "IAS.InfoBase.1", "IAS.MSChapErrorReporter", "IAS.MSChapErrorReporter.1", "IAS.Match",
 "IAS.Match.1", "IAS.NTEventLog", "IAS.NTEventLog.1", "IAS.NTGroups", "IAS.NTGroups.1",
 "IAS.NTSamAuthentication", "IAS.NTSamAuthentication.1", "IAS.NTSamNames",
 "IAS.NTSamNames.1", "IAS.NTSamPerUser", "IAS.NTSamPerUser.1", "IAS.NetDataStore",
 "IAS.NetDataStore.1", "IAS.OleDBDataStore", "IAS.OleDBDataStore.1", "IAS.Pipeline",
 "IAS.Pipeline.1", "IAS.PipelineManager", "IAS.PipelineManager.1", "IAS.PolicyEnforcer",
 "IAS.PolicyEnforcer.1", "IAS.RadiusProtocol", "IAS.RadiusProtocol.1", "IAS.Request", "IAS.Request.1",
 "IAS.SdoMachine", "IAS.SdoMachine.1", "IAS.SdoService", "IAS.SdoService.1", "IAS.Stage",
 "IAS.Stage.1", "IAS.TimeOfDay", "IAS.TimeOfDay.1", "IAS.URHandler", "IAS.URHandler.1",
 "ICOFiler.CoICOFiler.1", "IHTMLColorPicker.IHTMLColorPicker",
 "IHTMLColorPicker.IHTMLColorPicker.1", "IImgCtx", "IMsiServer", "INETCFG.Apprentice",

"INETCFG.Apprentice.1", "INetRepl.ReplInet", "INetRepl.ReplInet.1", "IPConfMSP.IPConfMSP",
 "IPConfMSP.IPConfMSP.1", "IPSEC.About", "IPSEC.About.1", "IPSEC.Extension",
 "IPSEC.Extension.1", "IPSEC.Snapin", "IPSEC.Snapin.1", "ISC.Enum", "ISC.Enum.1",
 "ISCHindi.ISCHindi", "ISCHindi.ISCHindi.1", "ISCThai.ISCThai", "ISCThai.ISCThai.1",
 "ISCVietnamese.ISCVietnamese", "ISCVietnamese.ISCVietnamese.1", "ISSimpleCommandCreator",
 "ISSimpleCommandCreator.1", "ITIR.DateNormalizer.5.2", "ITIR.DefDataSpaceNode.5.2",
 "ITIR.DefDataSpaceNodeElement.5.2", "ITIR.DefWordBreaker.5.2", "ITIR.DefWordSink.5.2",
 "ITIR.DefaultCharMap.5.2", "ITIR.DefaultStemmer.5.2", "ITIR.EngStemmer", "ITIR.EngStemmer.4",
 "ITIR.EpochNormalizer.5.2", "ITIR.IndexSearch", "ITIR.IndexSearch.4", "ITIR.LinearOpTable.5.2",
 "ITIR.LocalCatalog", "ITIR.LocalCatalog.4", "ITIR.LocalDatabase", "ITIR.LocalDatabase.4",
 "ITIR.LocalDatabase.5.2", "ITIR.LocalGroup", "ITIR.LocalGroup.4", "ITIR.LocalGroupArray",
 "ITIR.LocalGroupArray.4", "ITIR.LocalIndex.5.2", "ITIR.LocalWordWheel", "ITIR.LocalWordWheel.4",
 "ITIR.LocalWordWheel.5.2", "ITIR.MergeConfig.5.2", "ITIR.MergeDupResolver.5.2",
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 "ITIR.Query", "ITIR.Query.4", "ITIR.Query.5.2", "ITIR.ResultSet", "ITIR.ResultSet.4",
 "ITIR.ResultSet.5.2", "ITIR.ScratchWordWheel.5.2", "ITIR.StdWordBreaker", "ITIR.StdWordBreaker.4",
 "ITIR.StopListHandler.5.2", "ITIR.SystemSort", "ITIR.SystemSort.4", "ITIR.SystemSort.5.2",
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 "ITIR.WordWheelBuild.4", "ITIR.WordWheelBuild.5.2", "ITIR.WordWheelDataHandler.5.2",
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13 ~ 26 ページの出力は省略した

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"WordJPostcardWizard.Postcard", "WordJWatermark.Connect", "WordJWatermark.WaterMark",
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"Wsecedit.SAV.1", "Wsecedit.SCE", "Wsecedit.SCE.1", "Wsecedit.SCEAbout.1", "Wsecedit.SCEAbout.1",
"Wsecedit.SCMAbout.1", "Wsecedit.SCMAbout.1", "Wsecedit.SSAbout.1", "Wsecedit.SSAbout.1",
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"adbanner.adbanner.1", "cfw.cfw", "cfw.cfw.1", "clsid", "device", "device.1", "dlgCancl.cCancel", "file",
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"Inkfile", "mapifvbx.object", "mapifvbx.object.1", "mce.CCSProperties", "mce.CCSproperty",
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Control", "rmocx.RealPlayer G2 Control.1", "sca.sca", "sca.sca.1", "script", "snpvw.Snapshot Viewer
Control", "snpvw.Snapshot Viewer Control.1", "stapa.stapa", "stapa.stapa.1",
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"termmgr.VideoRenderTerminal", "tngen", "tngen.1", "tp2w1001.clsWork1001", "tp2w1011.clsWork1011",
"tp2w1012.clsWork1012", "tp2w1101.clsWork1101", "tp2w1104.clsWork1104", "tp2w1601.clsWork1601",
"tp2w1602.clsWork1602", "tp2w1800.clsWork1800", "tp2w4101.clsWork4101", "tp2w4102.clsWork4102",
"tp2w4103.clsWork4103", "tp2w4104.clsWork4104", "vca.vca", "vca.vca.1", "vsAwk.vsAwk",
"vsAwk.vsAwk.1", "vsElastic.vsElastic", "vsElastic.vsElastic.1", "vsIndexTab.vsIndexTab",
"vsIndexTab.vsIndexTab.1", "xmlfile", "xmlfile", "{015DCF7B-70EE-4D03-A58B-614AD15A4C7A}",
"{8D8763AB-E93B-4812-964E-F04E0008FD50}"
```

オブジェクト指向プログラミングではメソッドという言葉がでてきますがメソッドの実態をあなたのパソコンの中で見てみましょう。例として **Internet Explorer** を取上げます。下記のプログラムを実行してください。

C:\¥rubytest>**ruby -Ks method.rb** コマンドにより起動します。

<method.rb の内容>

```
require 'win32ole'
$stdout = File.open("test.txt", 'w')
# メソッドを調査する
ie = WIN32OLE.new('InternetExplorer.Application')
puts "InternetExplorer.Application のメソッド一覧です"
puts " "
puts ie.ole_methods
```

結果は test.txt に出力されます。下記の内容になったでしょう。

InternetExplorer.Application のメソッド一覧です

```
QueryInterface
AddRef
Release
GetTypeInfoCount
```

GetTypeInfo
GetIDsOfNames
Invoke
GoBack
GoForward
GoHome
GoSearch
Navigate
Refresh
Refresh2
Stop
Application
Parent
Container
Document
TopLevelContainer
Type
Left
Left
Top
Top
Width
Width
Height
Height
LocationName
LocationURL
Busy
Quit
ClientToWindow
PutProperty
GetProperty
Name
HWND
FullName
Path

Visible
Visible
StatusBar
StatusBar
StatusText
StatusText
ToolBar
ToolBar
MenuBar
MenuBar
FullScreen
FullScreen
Navigate2
QueryStatusWB
ExecWB
ShowBrowserBar
ReadyState
Offline
Offline
Silent
Silent
RegisterAsBrowser
RegisterAsBrowser
RegisterAsDropTarget
RegisterAsDropTarget
TheaterMode
TheaterMode
AddressBar
AddressBar
Resizable
Resizable
GetTypeInfoCount
GetTypeInfo
GetIDsOfNames
Invoke

InternetExplorer の制御を通じて Win32OLE を体験する

(Rubyist Magazine 第 3 号より)

プログラム ie.rb を C:\¥rubytest に入れているとします。

C:\¥rubytest>**ruby ie.rb** をコマンドプロンプトから入力することで起動します。

<ie.rb プログラムの内容>

```
require 'win32ole'  
ie = WIN32OLE.new('InternetExplorer.Application')  
ie.navigate("http://www.google.co.jp/")  
ie.Visible = true  
while ie.busy  
  sleep 1  
end  
q = ie.document.all.item("q")  
q.Value = "ruby"  
btnG = ie.document.all.item("btnG")  
btnG.click()
```

このプログラムは Google のページに移動し、テキストボックスに「Ruby」と入力し、「Google 検索」のボタンをクリックするという動作を行います。

この結果 InternetExplorer で Google の検索結果があなたのパソコンに表示されます。

オブジェクト指向により、色々なことができそうな気がしてきませんか？

是非、あなた自身でここにあげたプログラムを動かして見てオブジェクト指向の効果を味わってください。

参考文献：

Win32OLE 活用法 第 1 回

<http://jp.rubyist.net/magazine/?0003-Win32OLE>