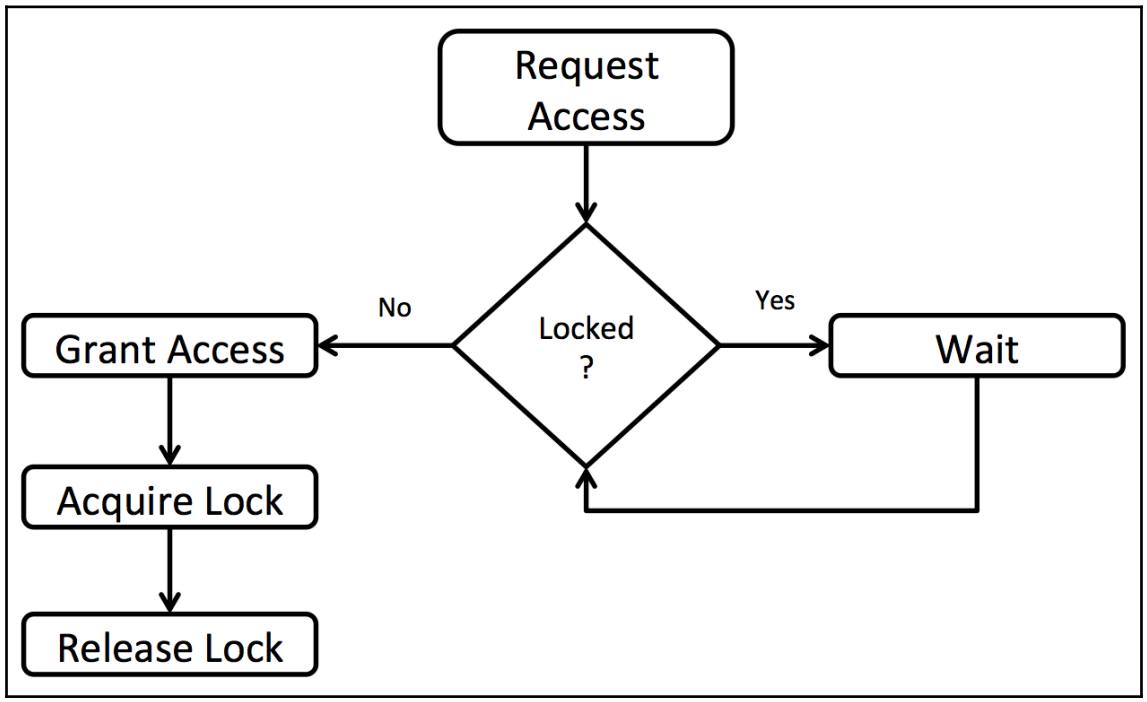
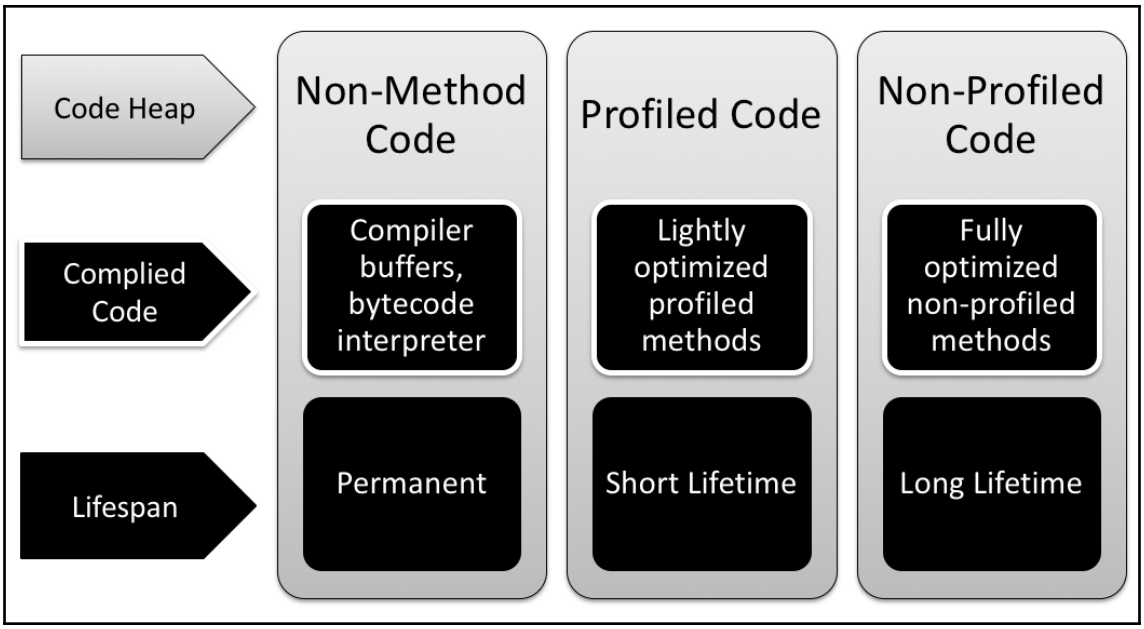
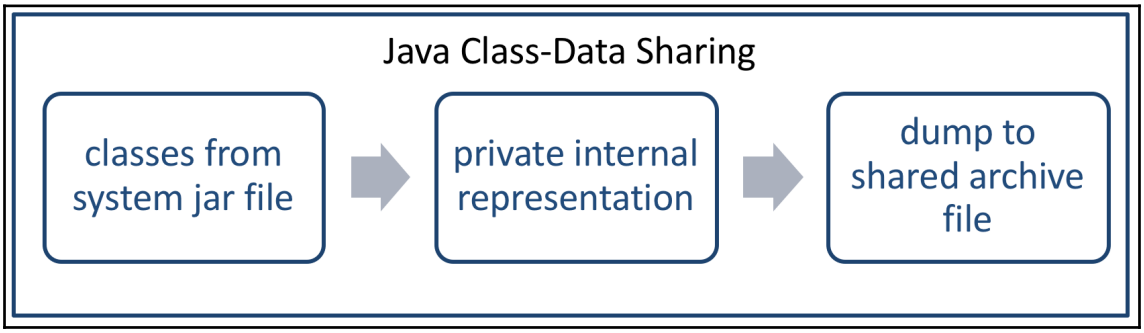
Chapter 1: The Java 11 Landscape

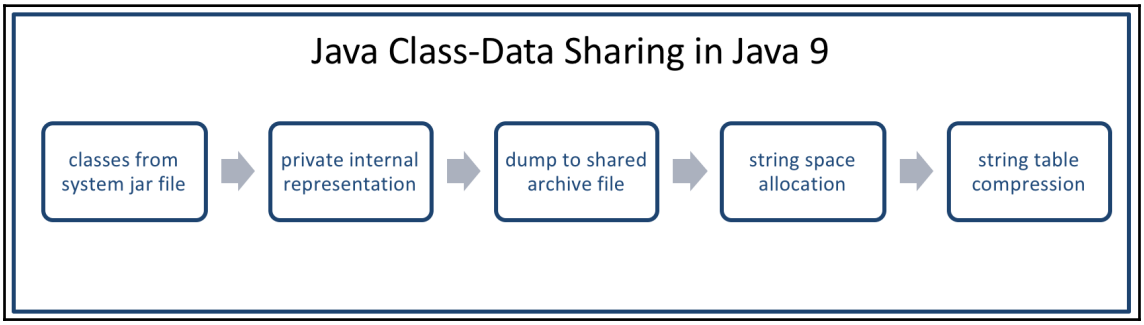
No Images.

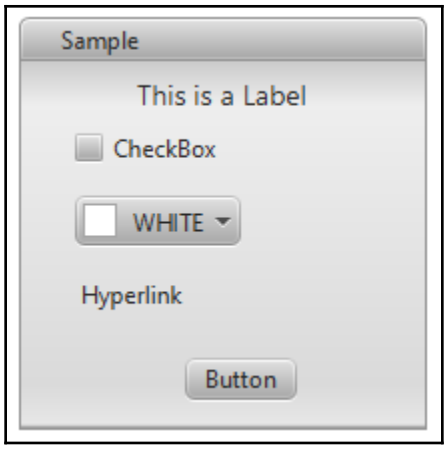
Chapter 2: Discovering Java 11

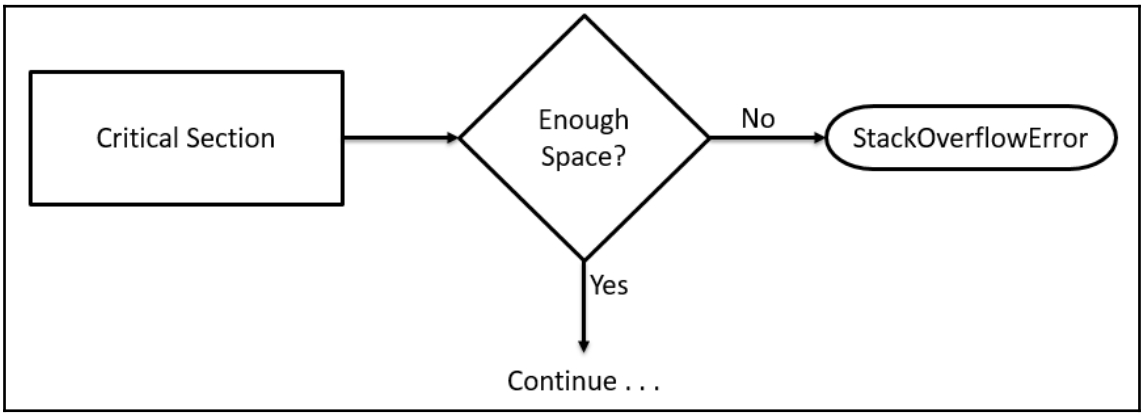


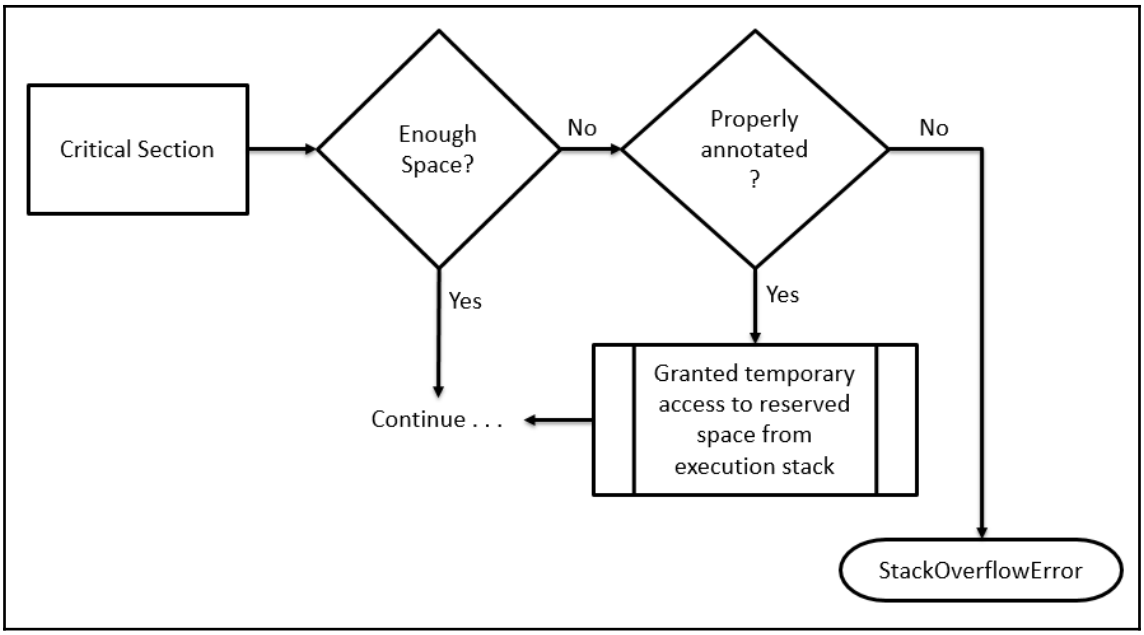

Code Heap
Complied Code
Lifespan
Non-Method Code
Compiler buffers, bytecode interpreter
Permanent
Profiled Code
Lightly optimized profiled methods
Short Lifetime
Non-Profiled Code
Fully optimized non-profiled methods
Long Lifetime

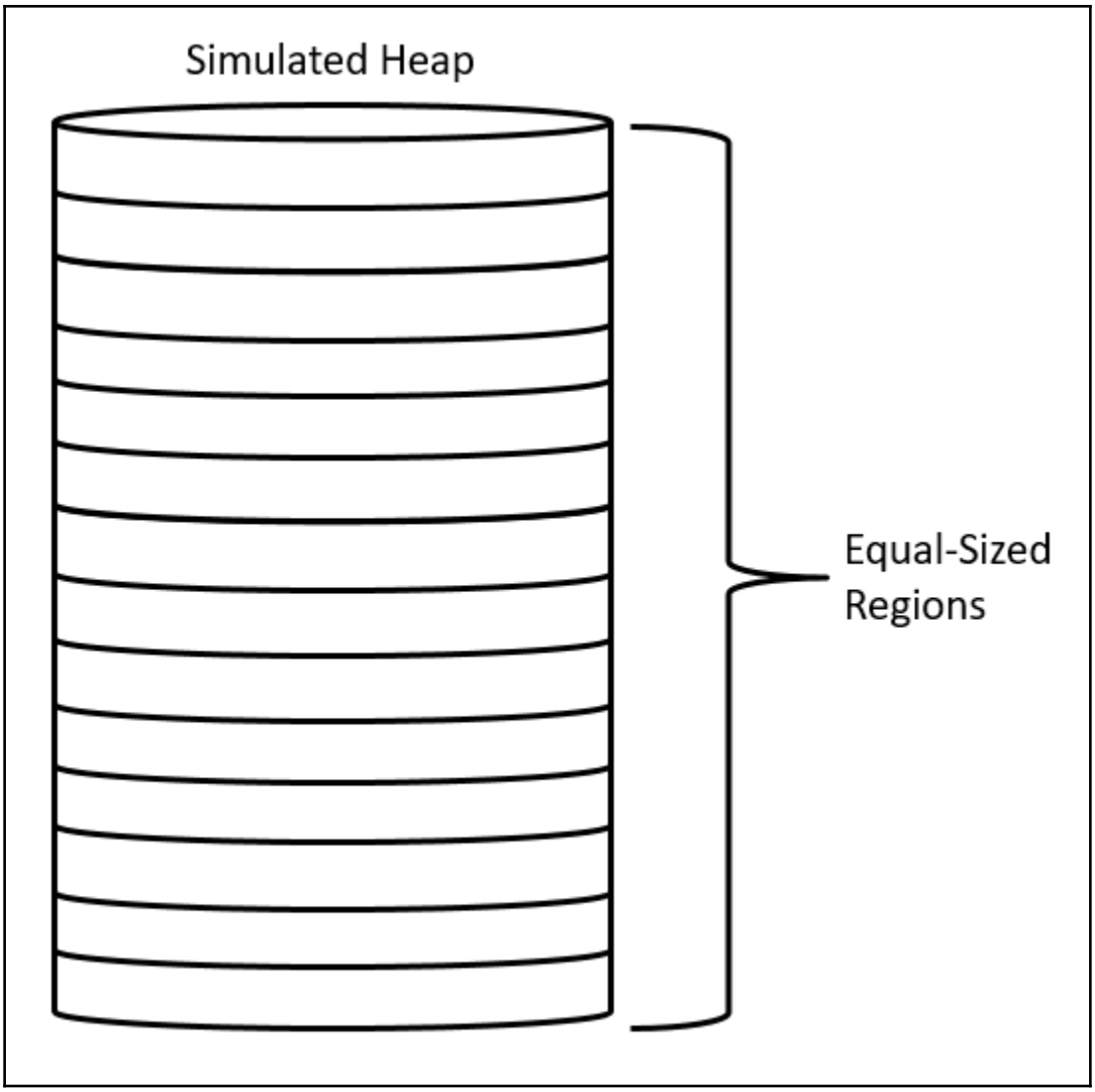

Java Class-Data Sharing
classes from system jar file
private internal representation
dump to shared archive file

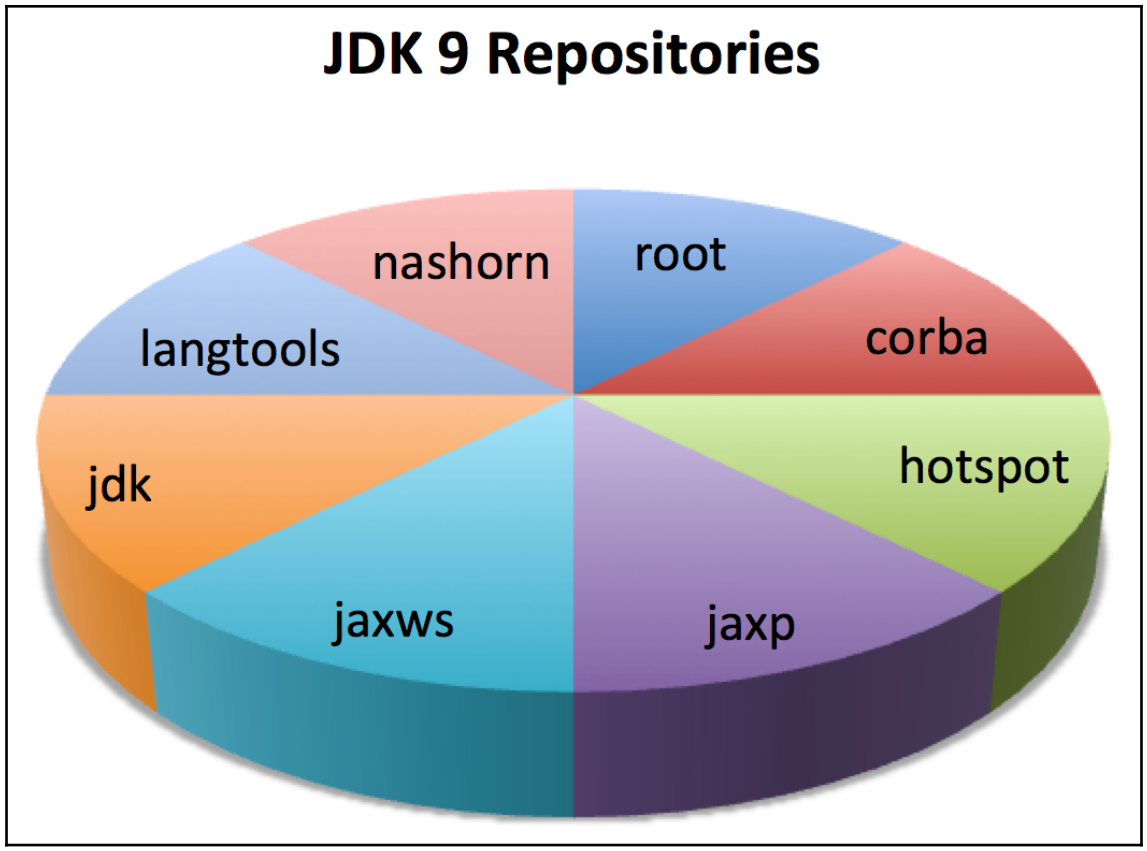

Java Class-Data Sharing in Java 9
classes from system jar file
private internal representation
dump to shared archive file
string space allocation
string table compression


Sample
This is a Label
CheckBox
WHITE
Hyperlink
Button


Critical Section
Enough Space?
No
StackOverflowError
Yes
Continue . . .


Critical Section
Enough Space?
No
Properly annotated ?
No
Yes
Yes
Granted temporary access to reserved space from execution stack
Continue . . .
StackOverflowError

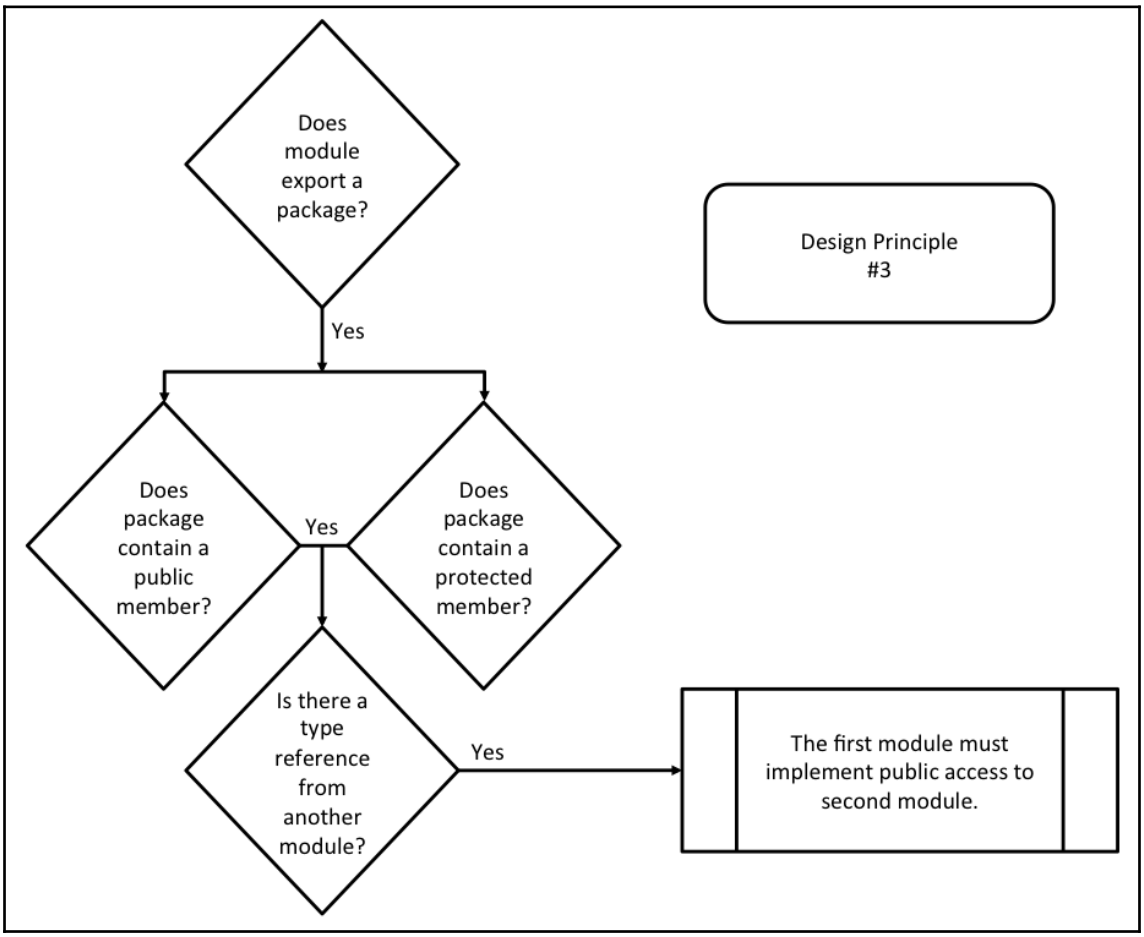

Simulated Heap
Equal-Sized
Regions

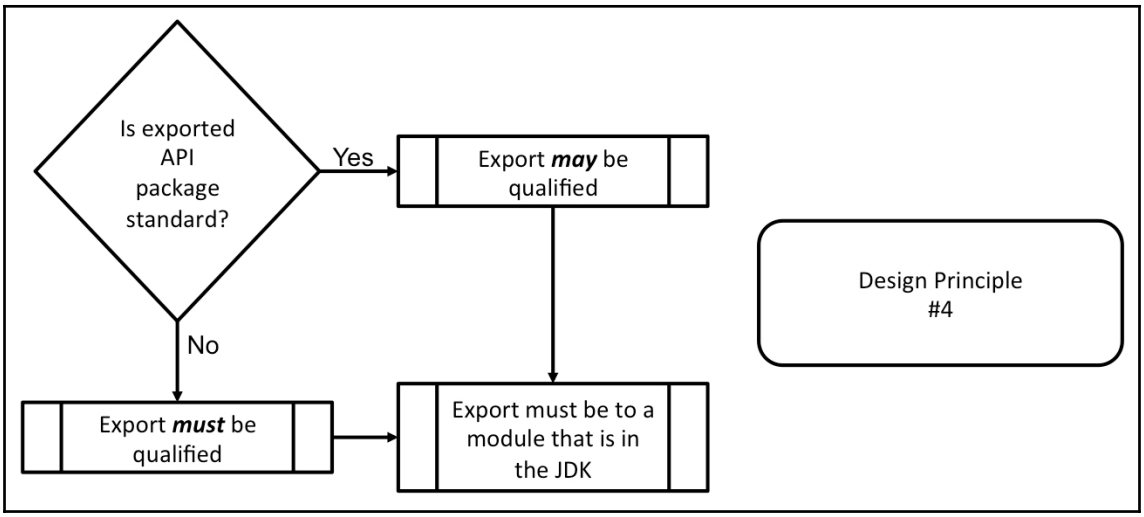

JDK 9 Repositories
nashorn
root
langtools
corba
jdk
hotspot
jaxws
jaxp

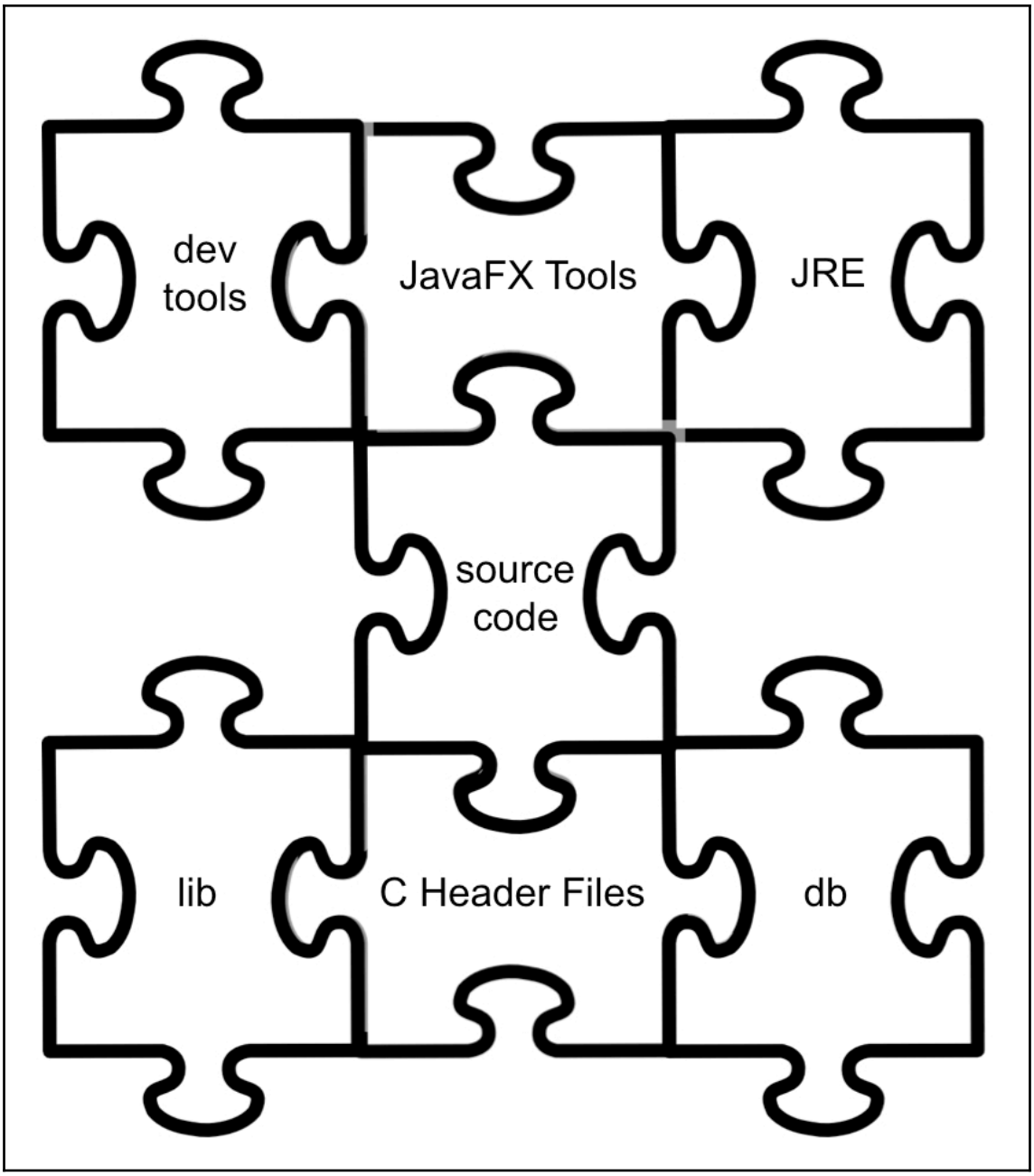
Chapter 3: Java 11 Fundamentals

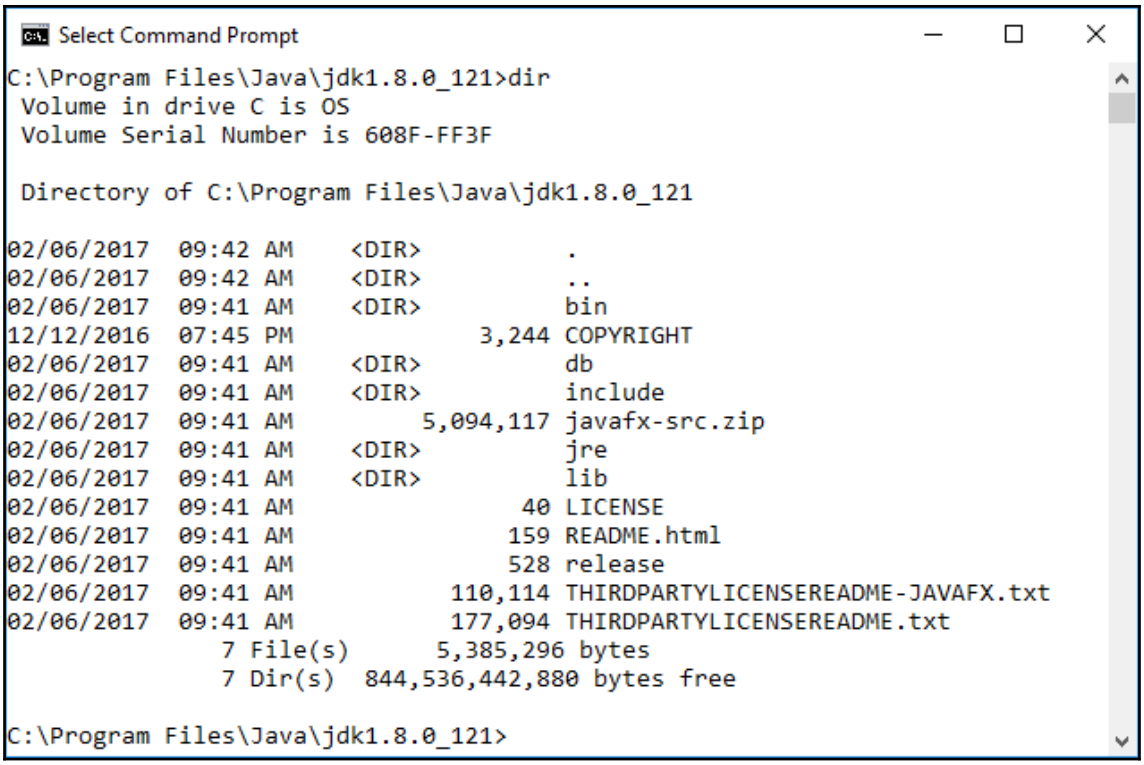
No Images.

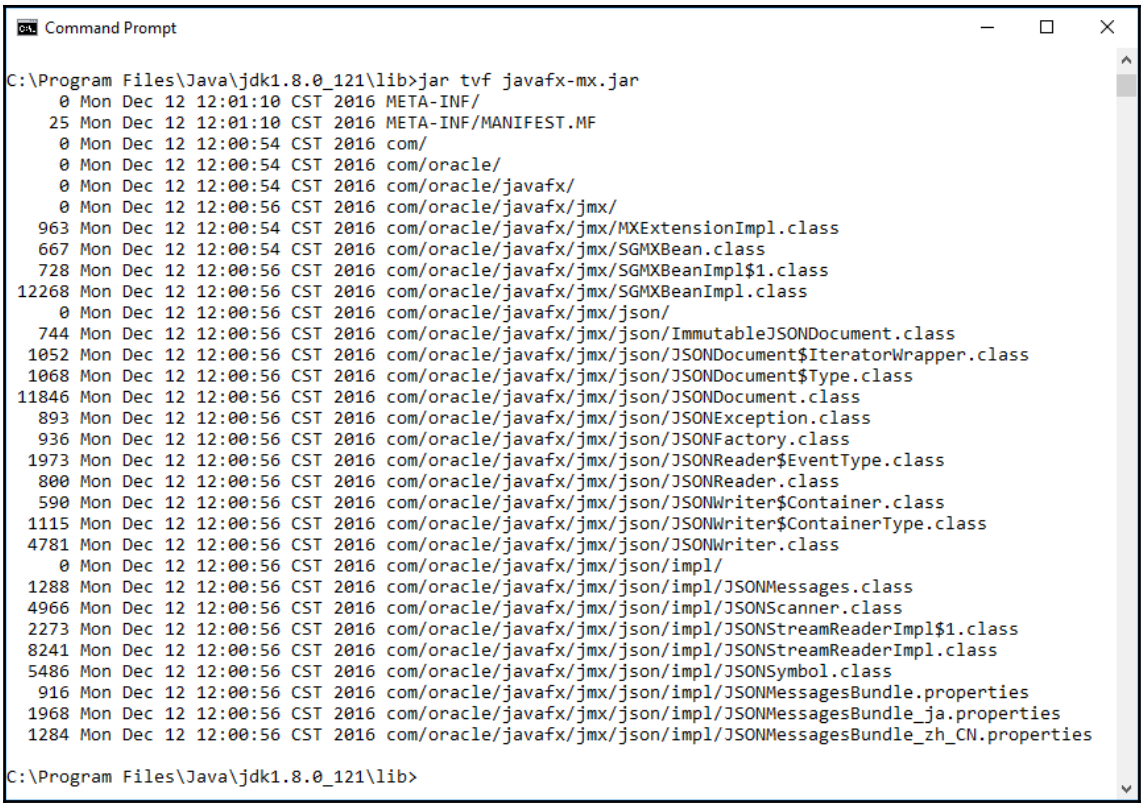
Chapter 4: Building Modular Applications with Java 11




Is exported API package standard?
Yes
No
Export *may* be qualified
Export *must* be qualified
Export must be to a module that is in the JDK
Design Principle #4

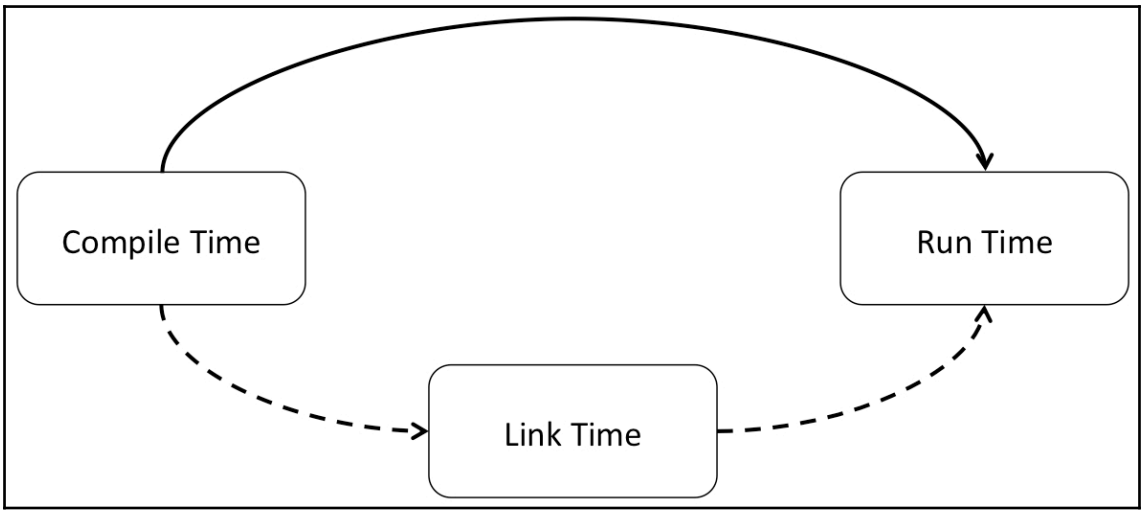

dev
tools
JavaFX Tools
JRE
source
code
lib
C Header Files
db

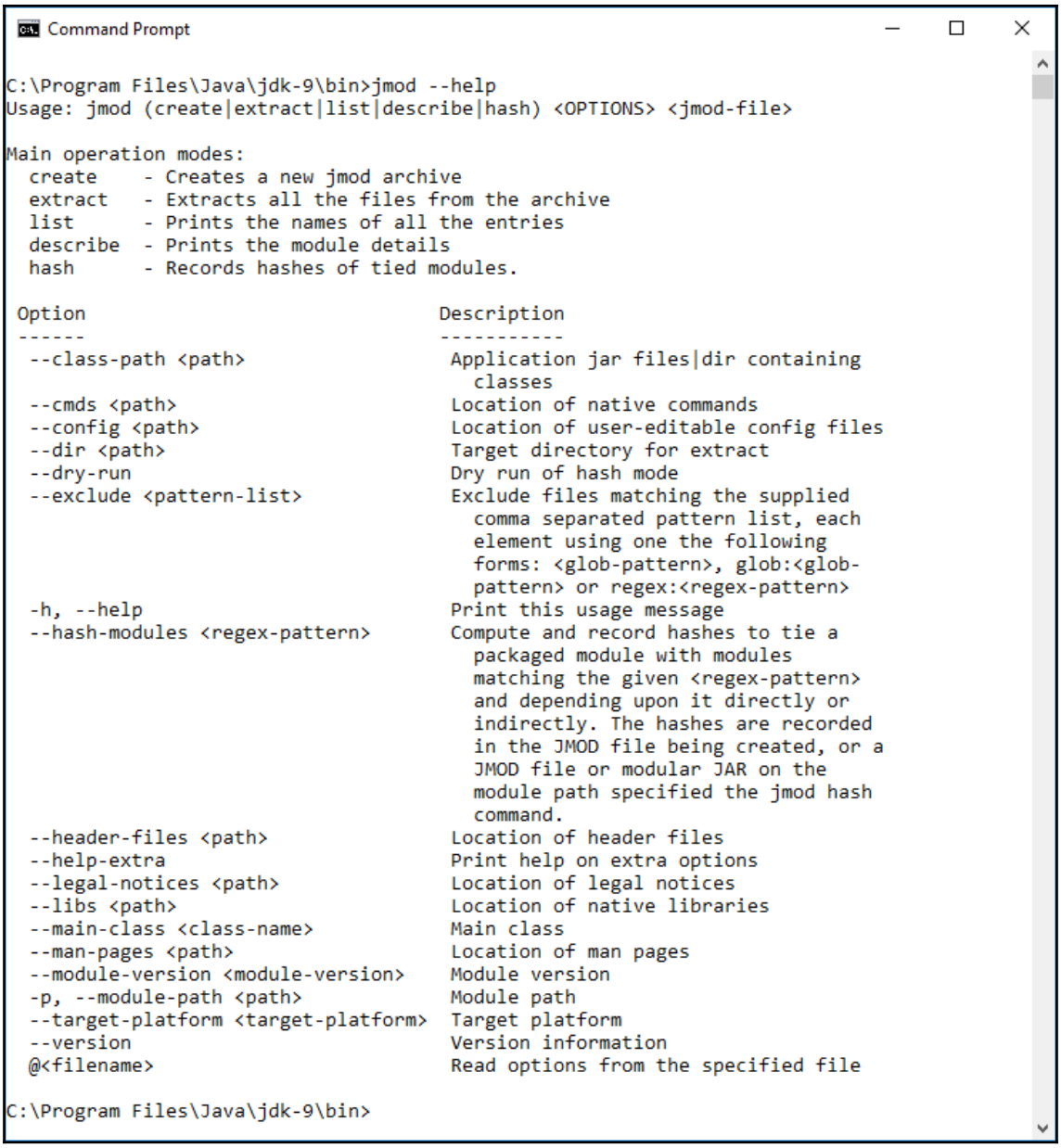

Select Command Prompt
C:\Program Files\Java\jdk1.8.0_121>dir
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\Program Files\Java\jdk1.8.0_121
02/06/2017 09:42 AM <DIR> .
02/06/2017 09:42 AM <DIR> ..
02/06/2017 09:41 AM <DIR> bin
12/12/2016 07:45 PM 3,244 COPYRIGHT
02/06/2017 09:41 AM <DIR> db
02/06/2017 09:41 AM <DIR> include
02/06/2017 09:41 AM 5,094,117 javafx-src.zip
02/06/2017 09:41 AM <DIR> jre
02/06/2017 09:41 AM <DIR> lib
02/06/2017 09:41 AM 40 LICENSE
02/06/2017 09:41 AM 159 README.html
02/06/2017 09:41 AM 528 release
02/06/2017 09:41 AM 110,114 THIRDPARTYLICENSEREADME-JAVAFX.txt
02/06/2017 09:41 AM 177,094 THIRDPARTYLICENSEREADME.txt
7 File(s) 5,385,296 bytes
7 Dir(s) 844,536,442,880 bytes free
C:\Program Files\Java\jdk1.8.0_121>

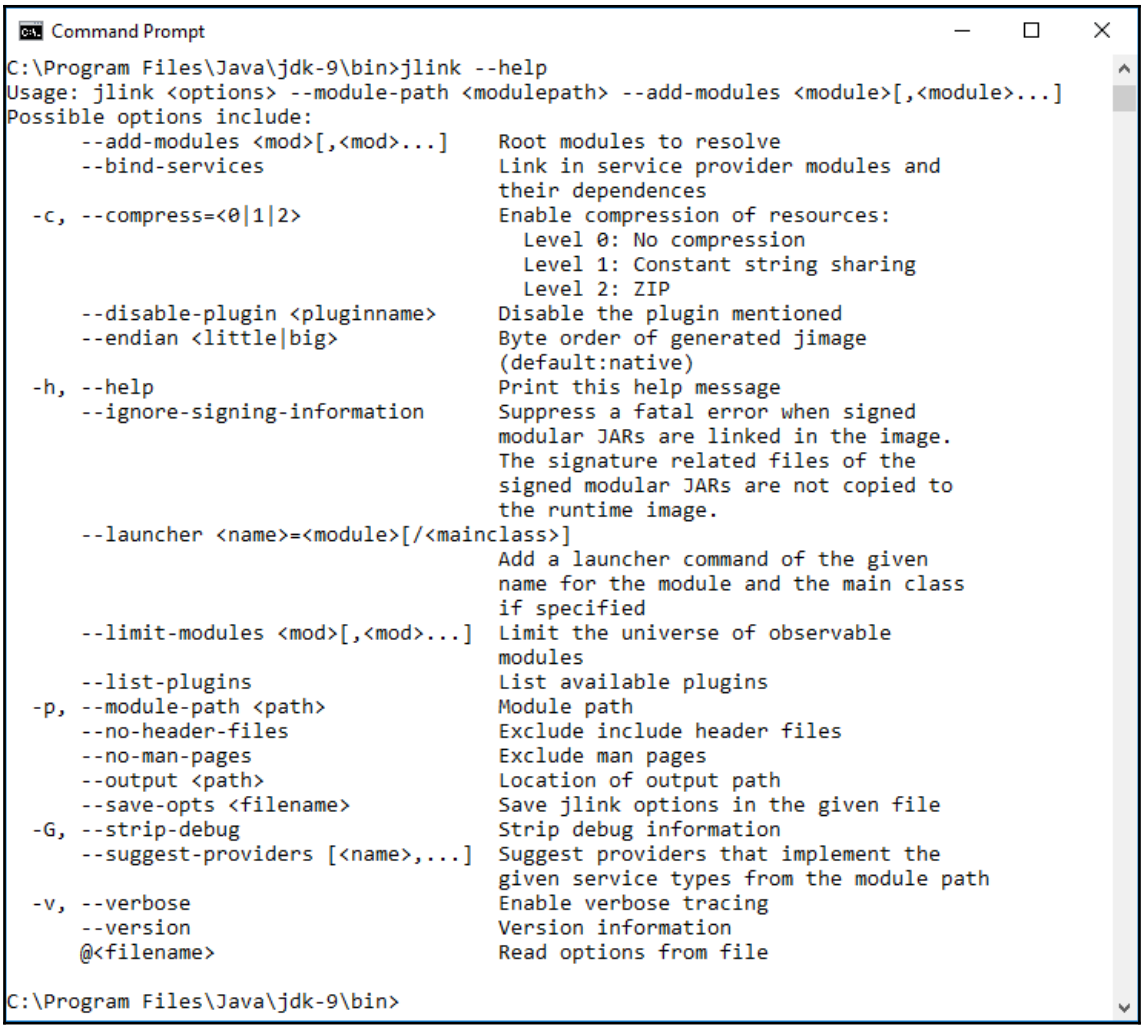

Command Prompt
C:\Program Files\Java\jdk1.8.0_121\lib>jar tvf javafx-mx.jar
0 Mon Dec 12 12:01:10 CST 2016 META-INF/
25 Mon Dec 12 12:01:10 CST 2016 META-INF/MANIFEST.MF
0 Mon Dec 12 12:00:54 CST 2016 com/
0 Mon Dec 12 12:00:54 CST 2016 com/oracle/
0 Mon Dec 12 12:00:54 CST 2016 com/oracle/javafx/
0 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/
963 Mon Dec 12 12:00:54 CST 2016 com/oracle/javafx/jmx/MXExtensionImpl.class
667 Mon Dec 12 12:00:54 CST 2016 com/oracle/javafx/jmx/SGMXBean.class
728 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/SGMXBeanImpl$1.class
12268 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/SGMXBeanImpl.class
0 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/
744 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/ImmutableJSONDocument.class
1052 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONDocument$IteratorWrapper.class
1068 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONDocument$Type.class
11846 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONDocument.class
893 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONException.class
936 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONFactory.class
1973 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONReader$EventType.class
800 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONReader.class
590 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONWriter$Container.class
1115 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONWriter$ContainerType.class
4781 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/JSONWriter.class
0 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/
1288 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONMessages.class
4966 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONScanner.class
2273 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONStreamReaderImpl$1.class
8241 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONStreamReaderImpl.class
5486 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONSymbol.class
916 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONMessagesBundle.properties
1968 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONMessagesBundle_ja.properties
1284 Mon Dec 12 12:00:56 CST 2016 com/oracle/javafx/jmx/json/impl/JSONMessagesBundle_zh_CN.properties
C:\Program Files\Java\jdk1.8.0_121\lib>

JRE Image	JDK Image
• bin • lib	• jre • bin • demo • sample • man • include • lib

Modular RunTime Image	Full JDK Image
• bin • conf • lib	• bin • conf • lib • demo • sample • man • include




Command Prompt
C:\Program Files\Java\jdk-9\bin>jmod --help
Usage: jmod (create|extract|list|describe|hash) <OPTIONS> <jmod-file>
Main operation modes:
create - Creates a new jmod archive
extract - Extracts all the files from the archive
list - Prints the names of all the entries
describe - Prints the module details
hash - Records hashes of tied modules.
Option
Description
--class-path <path>
Application jar files|dir containing classes
--cmds <path>
Location of native commands
--config <path>
Location of user-editable config files
--dir <path>
Target directory for extract
--dry-run
Dry run of hash mode
--exclude <pattern-list>
Exclude files matching the supplied comma separated pattern list, each element using one the following forms: <glob-pattern>, glob:<glob-pattern> or regex:<regex-pattern>
-h, --help
Print this usage message
--hash-modules <regex-pattern>
Compute and record hashes to tie a packaged module with modules matching the given <regex-pattern> and depending upon it directly or indirectly. The hashes are recorded in the JMOD file being created, or a JMOD file or modular JAR on the module path specified the jmod hash command.
--header-files <path>
Location of header files
--help-extra
Print help on extra options
--legal-notices <path>
Location of legal notices
--libs <path>
Location of native libraries
--main-class <class-name>
Main class
--man-pages <path>
Location of man pages
--module-version <module-version>
Module version
-p, --module-path <path>
Module path
--target-platform <target-platform>
Target platform
--version
Version information
@<filename>
Read options from the specified file
C:\Program Files\Java\jdk-9\bin>




```
-outdir <dir>
        name of the directory to generate output file to.
-srcdir <dir>
        Base dir of the files to pack.
-srcfiles <files>
        List of files in srcdir. If omitted, all files in srcdir (which
        is a mandatory argument in this case) will be used.
```

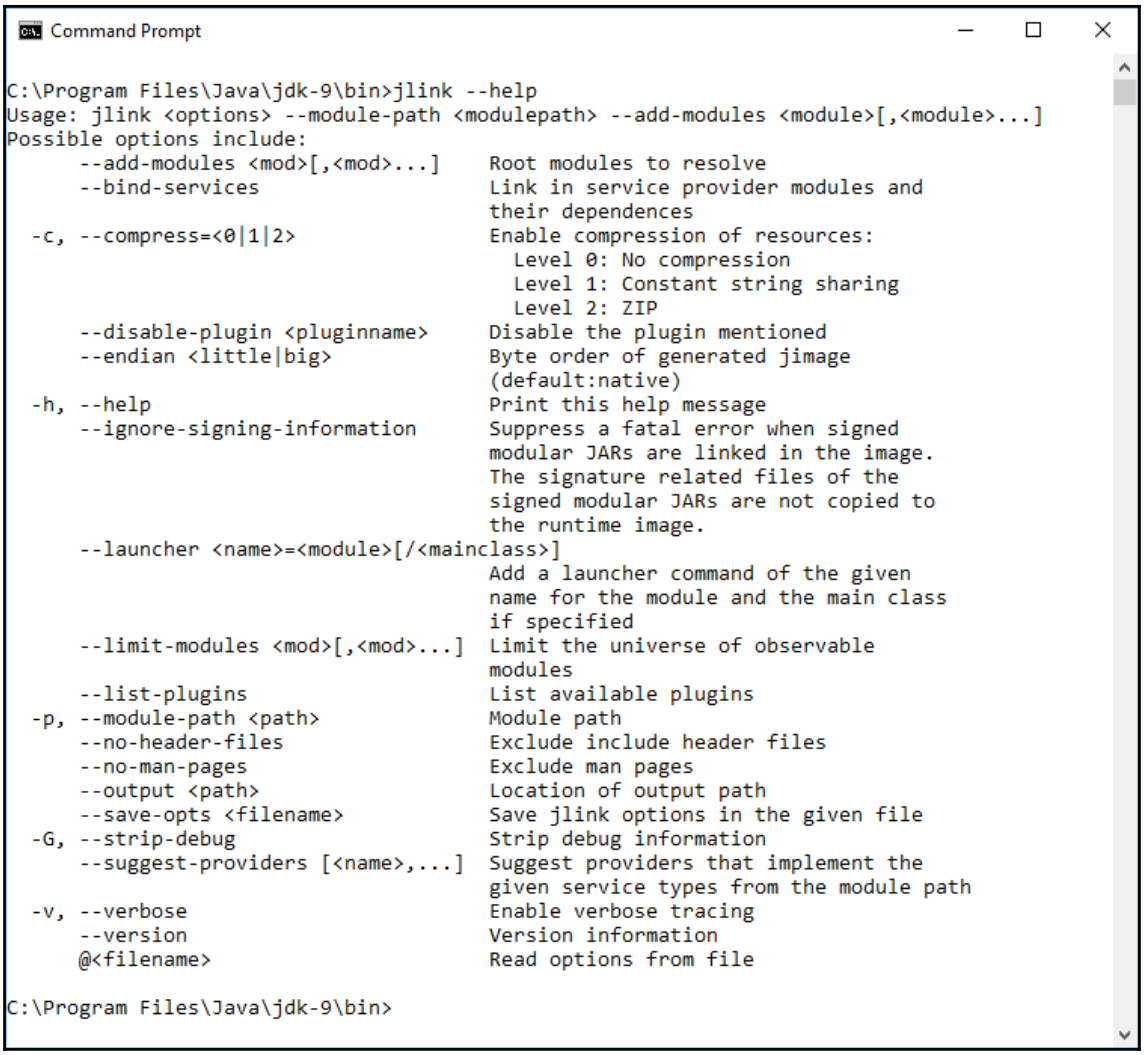
```
-appclass <application class>
        qualified name of the application class to be executed.
-preloader <preloader class>
        qualified name of the preloader class to be executed.
-paramfile <file>
        properties file with default named application parameters.
-argument arg
        An unnamed argument to be put in <fx:argument> element in the JNLP
        file.
-classpath <files>
        list of dependent jar file names.
-manifestAttrs <manifest attributes>
        List of additional manifest attributes. Syntax: "name1=value1,
        name2=value2,name3=value3.
-noembedlauncher
        If present, the packager will not add the JavaFX launcher classes
        to the jarfile.
-nocss2bin
        The packager won't convert CSS files to binary form before copying
        to jar.
-runtimeversion <version>
        version of the required JavaFX Runtime.
-outdir <dir>
        name of the directory to generate output file to.
-outfile <filename>
        The name (without the extension) of the resulting file.
-srcdir <dir>
        Base dir of the files to pack.
-srcfiles <files>
        List of files in srcdir. If omitted, all files in srcdir (which
        is a mandatory argument in this case) will be packed.
```

```
-native <type>
        generate self-contained application bundles (if possible).
        If type is specified then only bundle of this type is created.
        List of supported types includes: installer, image, exe, msi, dmg, pkg, rpm, deb.
-name <name>
        name of the application.
-appclass <application class>
        qualified name of the application class to be executed.
-outdir <dir>
        name of the directory to generate output file to.
-outfile <filename>
        The name (without the extension) of the resulting file.
-srcdir <dir>
        Base dir of the files to pack.
-srcfiles <files>
        List of files in srcdir. If omitted, all files in srcdir (which
        is a mandatory argument in this case) will be used.
-m <modulename>[/<mainclass>]
--module <modulename>[/<mainclass>]
        the initial module to resolve, and the name of the main class
        to execute if not specified by the module
-p <module path>
--module-path <module path>...
        A : separated list of directories, each directory
        is a directory of modules.
--add-modules <modulename>[,<modulename>...]
        root modules to resolve in addition to the initial module
--limit-modules <modulename>[,<modulename>...]
        limit the universe of observable modules
--strip-native-commands <true/false>
        include or exclude the native commands
-title <title>
        title of the application.
-vendor <vendor>
```

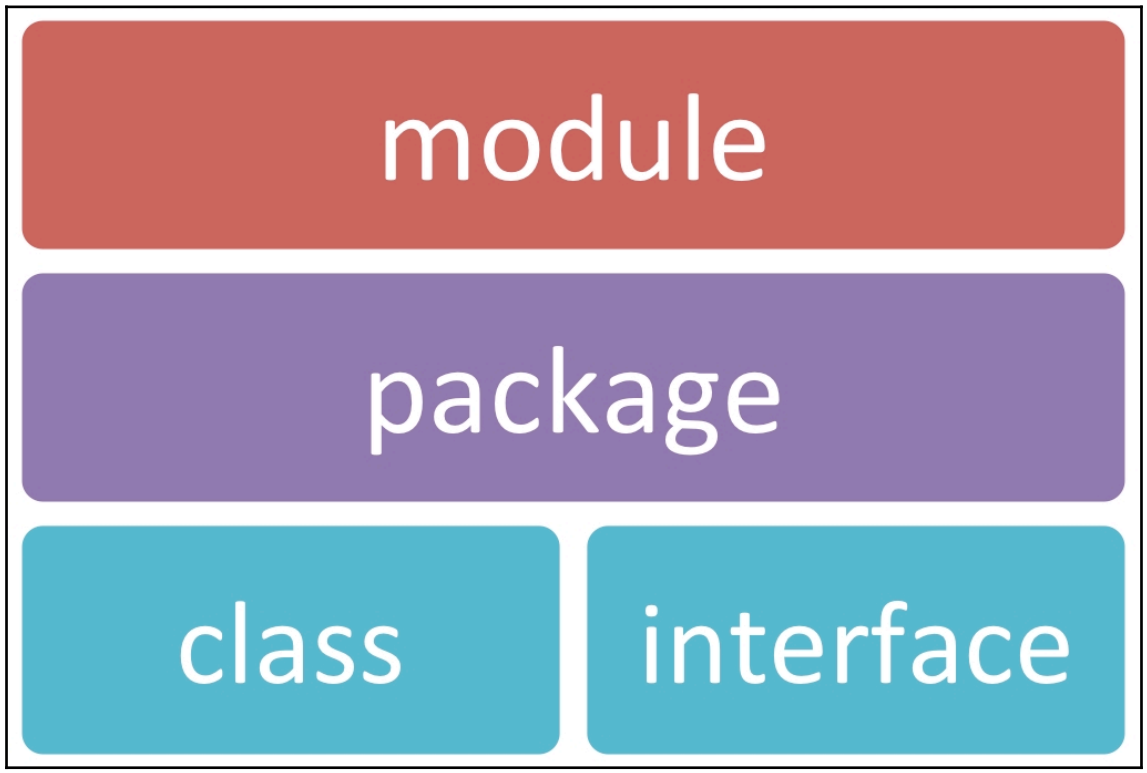
```
-description <description>
        description of the application.
-embedjnlp
        If present, the jnlp file will be embedded in the html document.
-embedCertificates
        If present, the certificates will be embedded in the jnlp file.
-allpermissions
        If present, the application will require all security permissions
        in the jnlp file.
-updatemode <updatemode>
        sets the update mode for the jnlp file.
-isExtension
        if present, the srcfiles are treated as extensions.
-callbacks
        specifies user callback methods in generated HTML. The format is
        "name1:value1,name2:value2,..."
-templateInFilename
        name of the html template file. Placeholders are in form of
        #XXXX.YYYY(APPID)#
-templateOutFilename
        name of the html file to write the filled-in template to.
-templateId
        Application ID of the application for template processing.
-argument arg
        An unnamed argument to be put in <fx:argument> element in the JNLP
        file.
-preloader <preloader class>
        qualified name of the preloader class to be executed.
-paramfile <file>
        properties file with default named application parameters.
-htmlparamfile <file>
        properties file with parameters for the resulting applet.
-width <width>
        width of the application.
-height <height>
        height of the application.
```

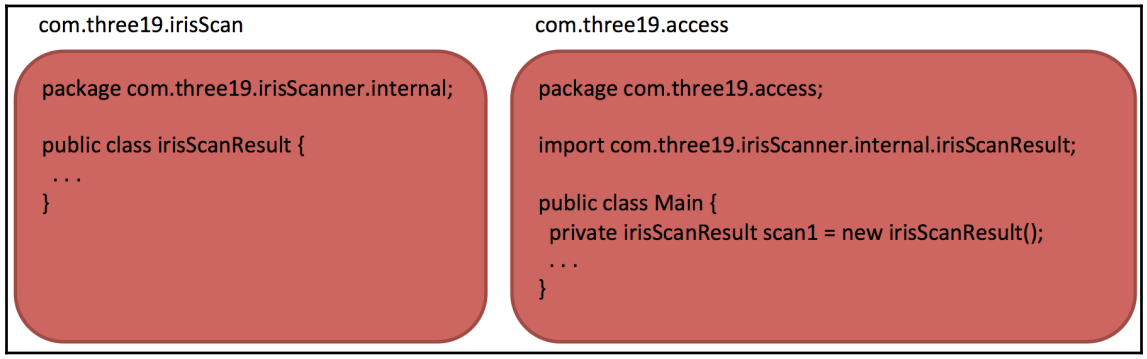
```
-appclass <application class>
        qualified name of the application class to be executed.
-preloader <preloader class>
        qualified name of the preloader class to be executed.
-classpath <files>
        list of dependent jar file names.
-name <name>
        name of the application.
-width <width>
        width of the application.
-height <height>
        height of the application.
-v      enable verbose output.
```

```
-keyStore <file>
        Keystore filename.
-alias
        Alias for the key.
-storePass
        Password to check integrity of the keystore or unlock the keystore.
-keyPass
        Password for recovering the key.
-storeType
        Keystore type, the default value is "jks".
-outdir <dir>
        name of the directory to generate output file(s) to.
-srcdir <dir>
        Base dir of the files to signed.
-srcfiles <files>
        List of files in srcdir. If omitted, all files in srcdir (which
        is a mandatory argument in this case) will be signed.
```


Command Prompt
C:\Program Files\Java\jdk-9\bin>jlink --help
Usage: jlink <options> --module-path <modulepath> --add-modules <module>[,<module>...]
Possible options include:
--add-modules <mod>[,<mod>...] Root modules to resolve
--bind-services Link in service provider modules and their dependences
-c, --compress=<0|1|2> Enable compression of resources:
Level 0: No compression
Level 1: Constant string sharing
Level 2: ZIP
--disable-plugin <pluginname> Disable the plugin mentioned
--endian <little|big> Byte order of generated jimage (default:native)
-h, --help Print this help message
--ignore-signing-information Suppress a fatal error when signed modular JARs are linked in the image. The signature related files of the signed modular JARs are not copied to the runtime image.
--launcher <name>=<module>[/<mainclass>] Add a launcher command of the given name for the module and the main class if specified
--limit-modules <mod>[,<mod>...] Limit the universe of observable modules
--list-plugins List available plugins
-p, --module-path <path> Module path
--no-header-files Exclude include header files
--no-man-pages Exclude man pages
--output <path> Location of output path
--save-opts <filename> Save jlink options in the given file
-G, --strip-debug Strip debug information
--suggest-providers [<name>,...] Suggest providers that implement the given service types from the module path
-v, --verbose Enable verbose tracing
--version Version information
@<filename> Read options from file
C:\Program Files\Java\jdk-9\bin>

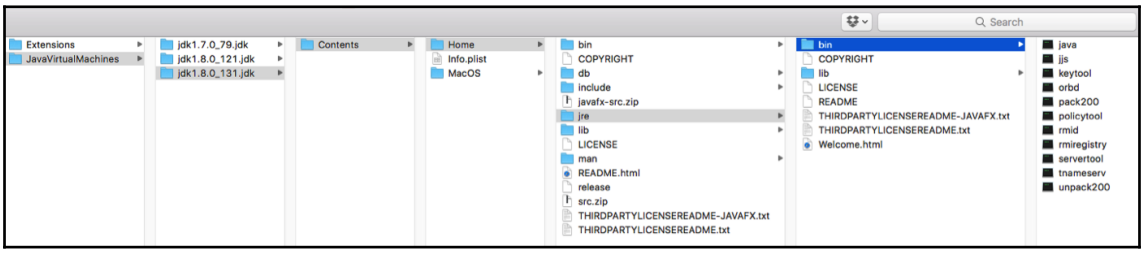
Chapter 5: Migrating Applications to Java 11

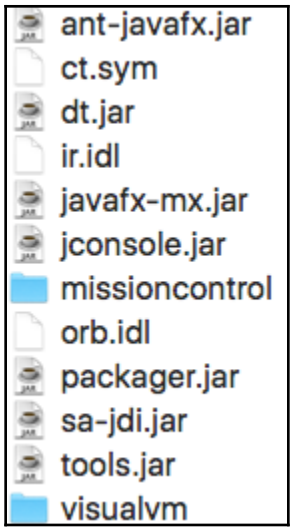


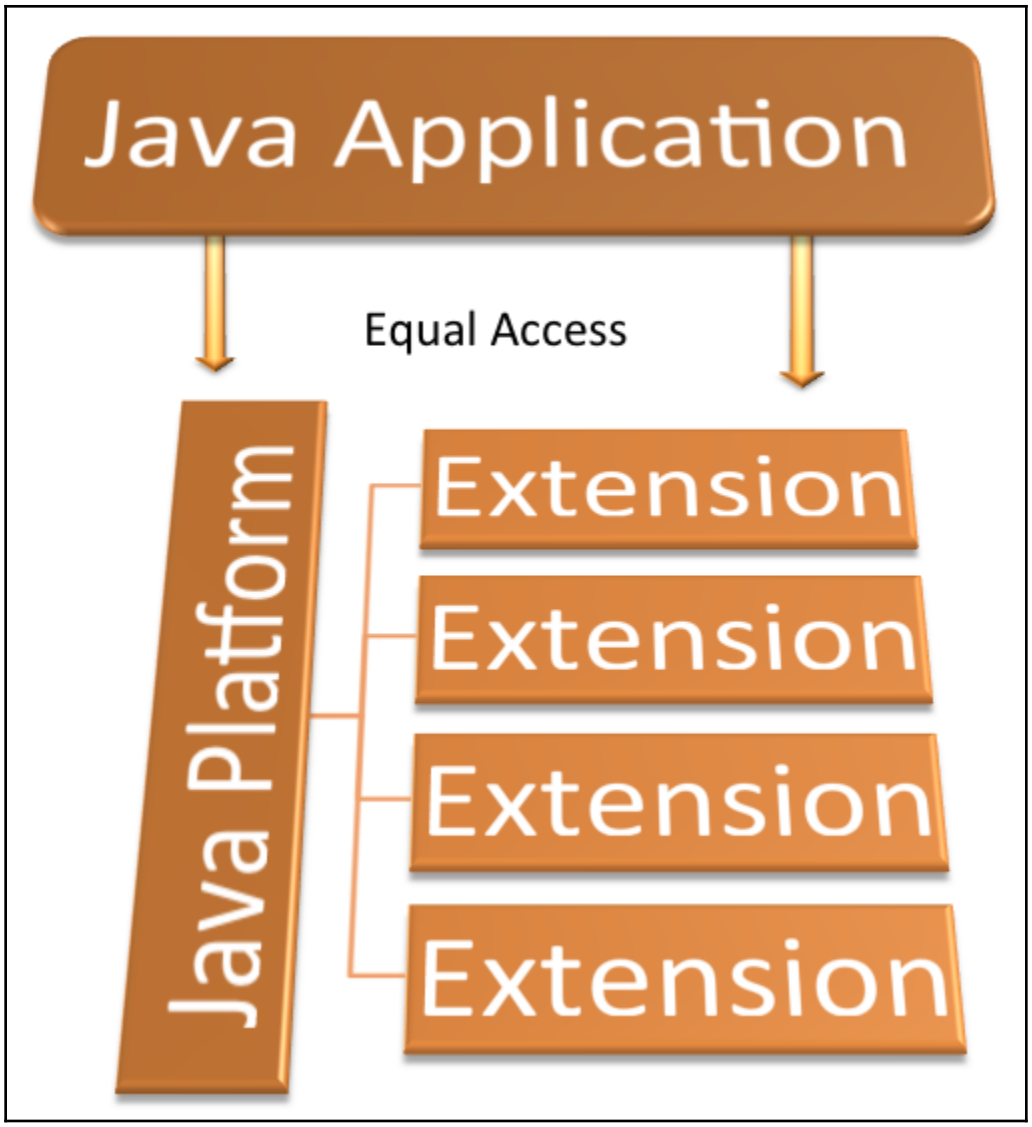


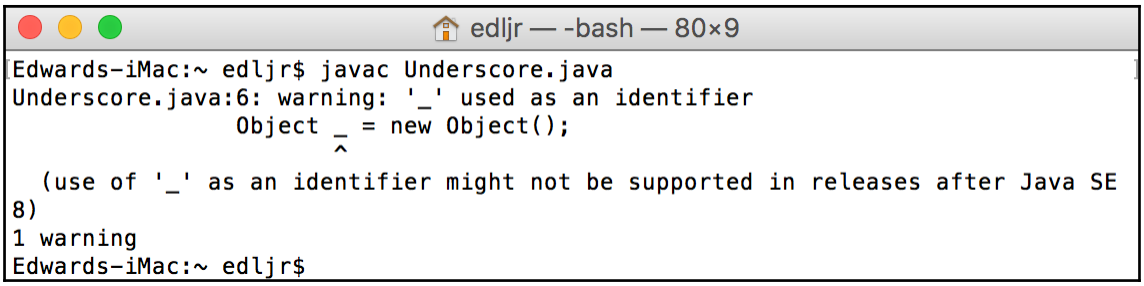
```
edljr — -bash — 80×24
Edwards-iMac:~ edljr$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$ javac GeneratePassword.java
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$ java GeneratePassword
How long would you like your password (min 8)?
32

Your new 32-character password is: B#CZy0z1Mq0WI@dkFfiuG9BrHw$w9KFg
```

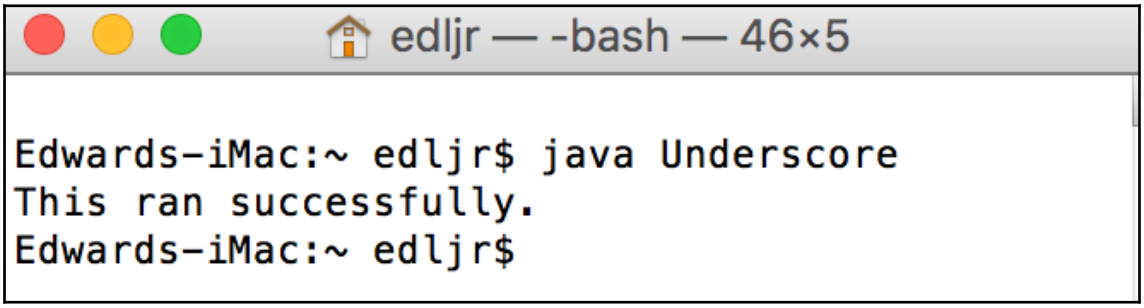
```
edljr — -bash — 80×16
Edwards-iMac:~ edljr$ java -version
java version "10" 2018-03-20
Java(TM) SE Runtime Environment 18.3 (build 10+46)
Java HotSpot(TM) 64-Bit Server VM 18.3 (build 10+46, mixed mode)
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$ javac GeneratePassword.java
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$
Edwards-iMac:~ edljr$ java GeneratePassword
How long would you like your password (min 8)?
32

Your new 32-character password is: INQGRPyX1S+yirmcnBnCLm%qtJ169TSB
Edwards-iMac:~ edljr$
```

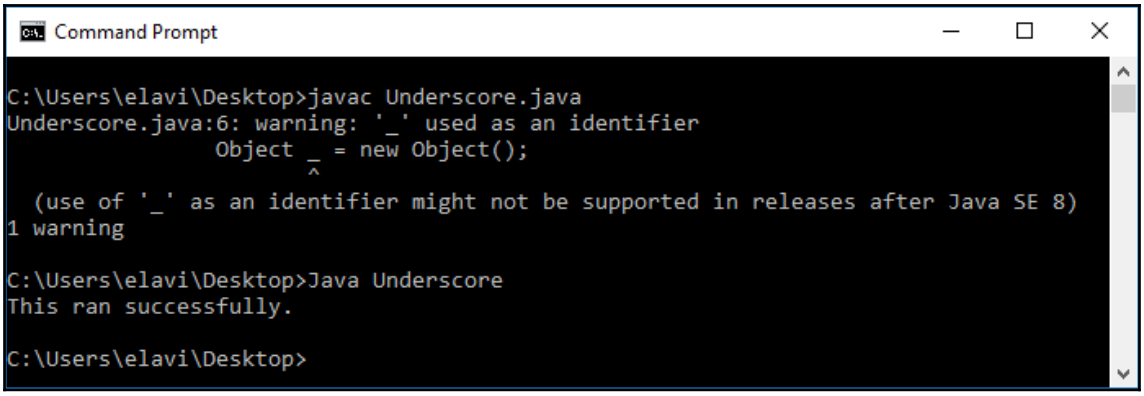


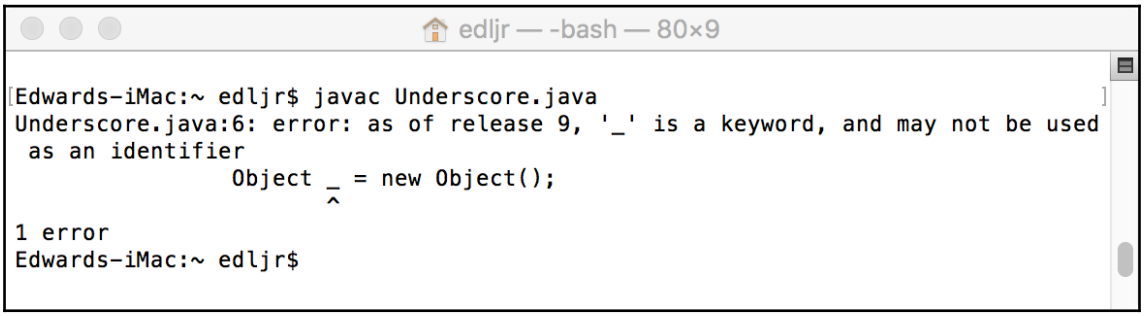

ant-javafx.jar
ct.sym
dt.jar
ir.idl
javafx-mx.jar
jconsole.jar
missioncontrol
orb.idl
packager.jar
sa-jdi.jar
tools.jar
visualvm


Java Application
Equal Access
Java Platform
Extension
Extension
Extension
Extension


edljr — -bash — 80×9
Edwards-iMac:~ edljr$ javac Underscore.java
Underscore.java:6: warning: '_' used as an identifier
Object _ = new Object();
^
(use of '_' as an identifier might not be supported in releases after Java SE 8)
1 warning
Edwards-iMac:~ edljr$


edljr — -bash — 46×5
Edwards-iMac:~ edljr$ java Underscore
This ran successfully.
Edwards-iMac:~ edljr$


Command Prompt
C:\Users\elavi\Desktop>javac Underscore.java
Underscore.java:6: warning: '_' used as an identifier
Object _ = new Object();
^
(use of '_' as an identifier might not be supported in releases after Java SE 8)
1 warning
C:\Users\elavi\Desktop>Java Underscore
This ran successfully.
C:\Users\elavi\Desktop>

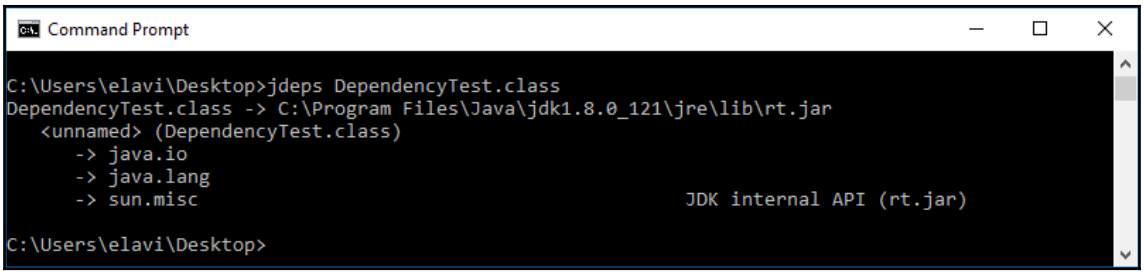

edljr — -bash — 80×9
Edwards-iMac:~ edljr$ javac Underscore.java
Underscore.java:6: error: as of release 9, '_' is a keyword, and may not be used as an identifier
Object _ = new Object();
^
1 error
Edwards-iMac:~ edljr$

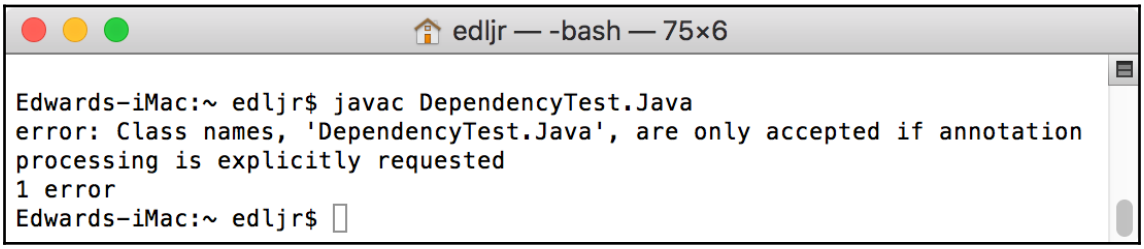
```
Edwards-iMac:~ edljr$ jdeps -help
Usage: jdeps <options> <path ...>]
<path> can be a pathname to a .class file, a directory, a JAR file.

Possible options include:
  -dotoutput <dir>
  --dot-output <dir>            Destination directory for DOT file output
  -s       -summary             Print dependency summary only.
  -v       -verbose             Print all class level dependences
                                Equivalent to -verbose:class -filter:none.
  -verbose:package              Print package-level dependences excluding
                                dependences within the same package by default
  -verbose:class                Print class-level dependences excluding
                                dependences within the same package by default
  -apionly
  --api-only                    Restrict analysis to APIs i.e. dependences
                                from the signature of public and protected
                                members of public classes including field
                                type, method parameter types, returned type,
                                checked exception types etc.
  -jdkinternals
  --jdk-internals               Finds class-level dependences on JDK internal
                                APIs. By default, it analyzes all classes
                                on --class-path and input files unless -include
                                option is specified. This option cannot be
                                used with -p, -e and -s options.
                                WARNING: JDK internal APIs are inaccessible.
  -cp <path>
  -classpath <path>
  --class-path <path>           Specify where to find class files
  --module-path <module path>   Specify module path
  --upgrade-module-path <module path>  Specify upgrade module path
  --system <java-home>          Specify an alternate system module path
  --add-modules <module-name>[,<module-name>...]
                                Adds modules to the root set for analysis
  --multi-release <version>     Specifies the version when processing
                                multi-release jar files.  <version> should
                                be integer >= 9 or base.
  -q       -quiet               Suppress warning messages
  -version --version            Version information
```

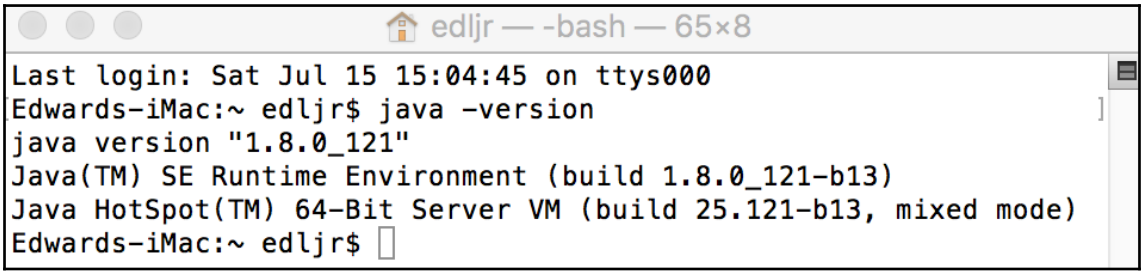
```
edljr — -bash — 85×14
Edwards-iMac:~ edljr$ javac DependencyTest.java
DependencyTest.java:1: warning: BASE64Encoder is internal proprietary API and may be
removed in a future release
import sun.misc.BASE64Encoder;
               ^
DependencyTest.java:6: warning: BASE64Encoder is internal proprietary API and may be
removed in a future release
                BASE64Encoder.class.newInstance();
                ^
2 warnings
Edwards-iMac:~ edljr$ java DependencyTest
This Java app ran successfully.
Edwards-iMac:~ edljr$
```

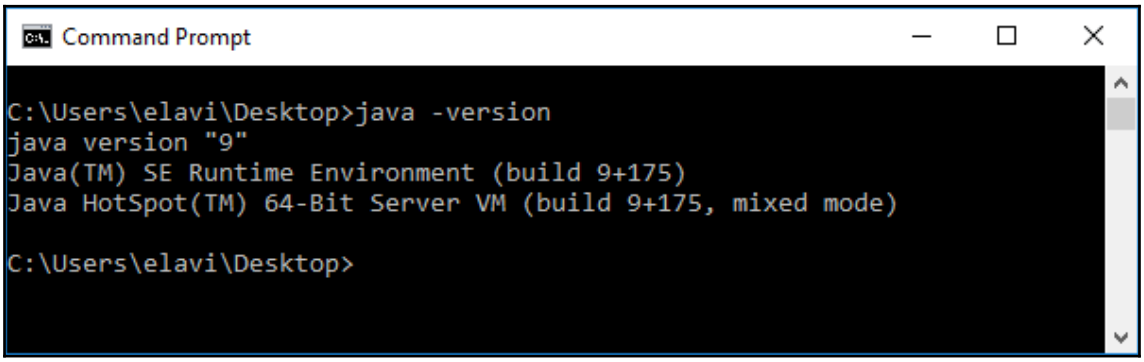
```
Command Prompt

C:\Users\elavi\Desktop>javac DependencyTest.java
DependencyTest.java:1: warning: BASE64Encoder is internal proprietary API and may be removed in a
 future release
import sun.misc.BASE64Encoder;
               ^
DependencyTest.java:6: warning: BASE64Encoder is internal proprietary API and may be removed in a
 future release
                BASE64Encoder.class.newInstance();
                ^
2 warnings
```

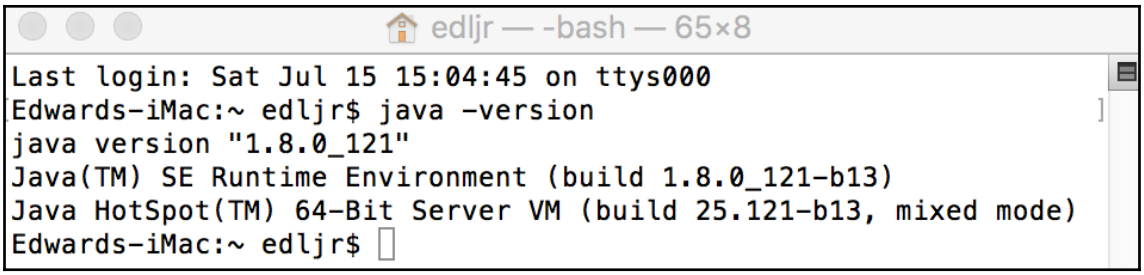
```
Command Prompt

C:\Users\elavi\Desktop>java DependencyTest
Exception in thread "main" java.lang.NoClassDefFoundError: sun/misc/BASE64Encoder
        at DependencyTest.main(DependencyTest.java:6)
Caused by: java.lang.ClassNotFoundException: sun.misc.BASE64Encoder
        at java.base/jdk.internal.loader.BuiltinClassLoader.loadClass(Unknown Source)
        at java.base/jdk.internal.loader.ClassLoaders$AppClassLoader.loadClass(Unknown Source)
        at java.base/java.lang.ClassLoader.loadClass(Unknown Source)
        ... 1 more

C:\Users\elavi\Desktop>
```

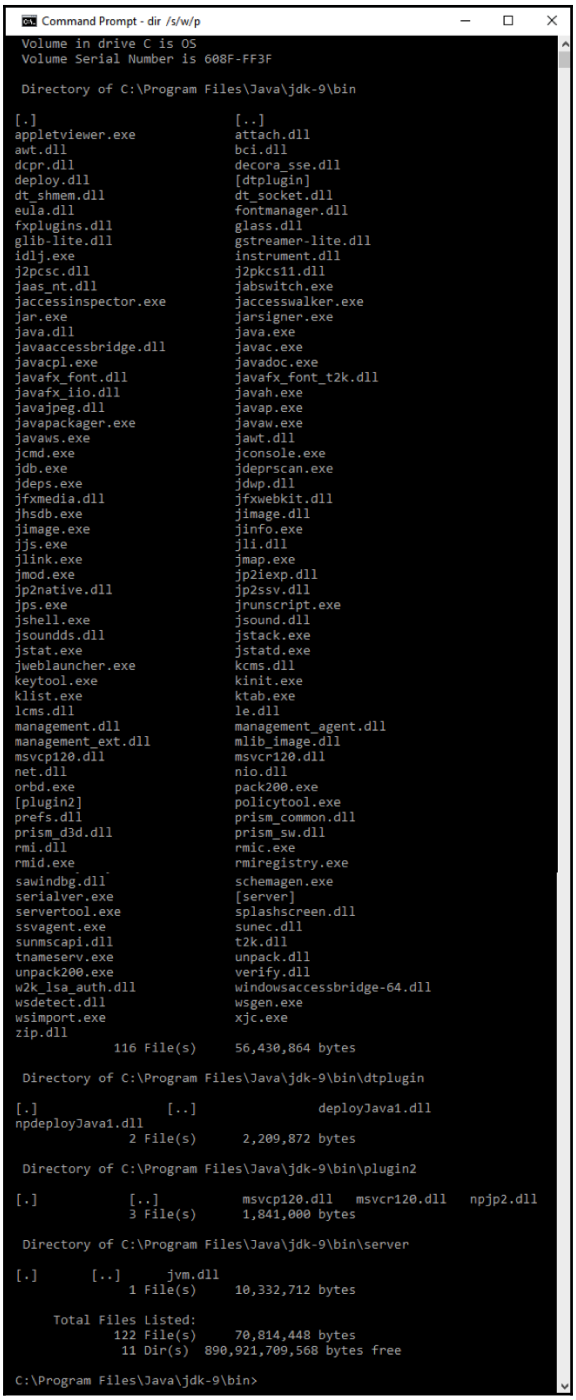

Command Prompt
C:\Users\elavi\Desktop>jdeps DependencyTest.class
DependencyTest.class -> C:\Program Files\Java\jdk1.8.0_121\jre\lib\rt.jar
<unnamed> (DependencyTest.class)
-> java.io
-> java.lang
-> sun.misc JDK internal API (rt.jar)
C:\Users\elavi\Desktop>

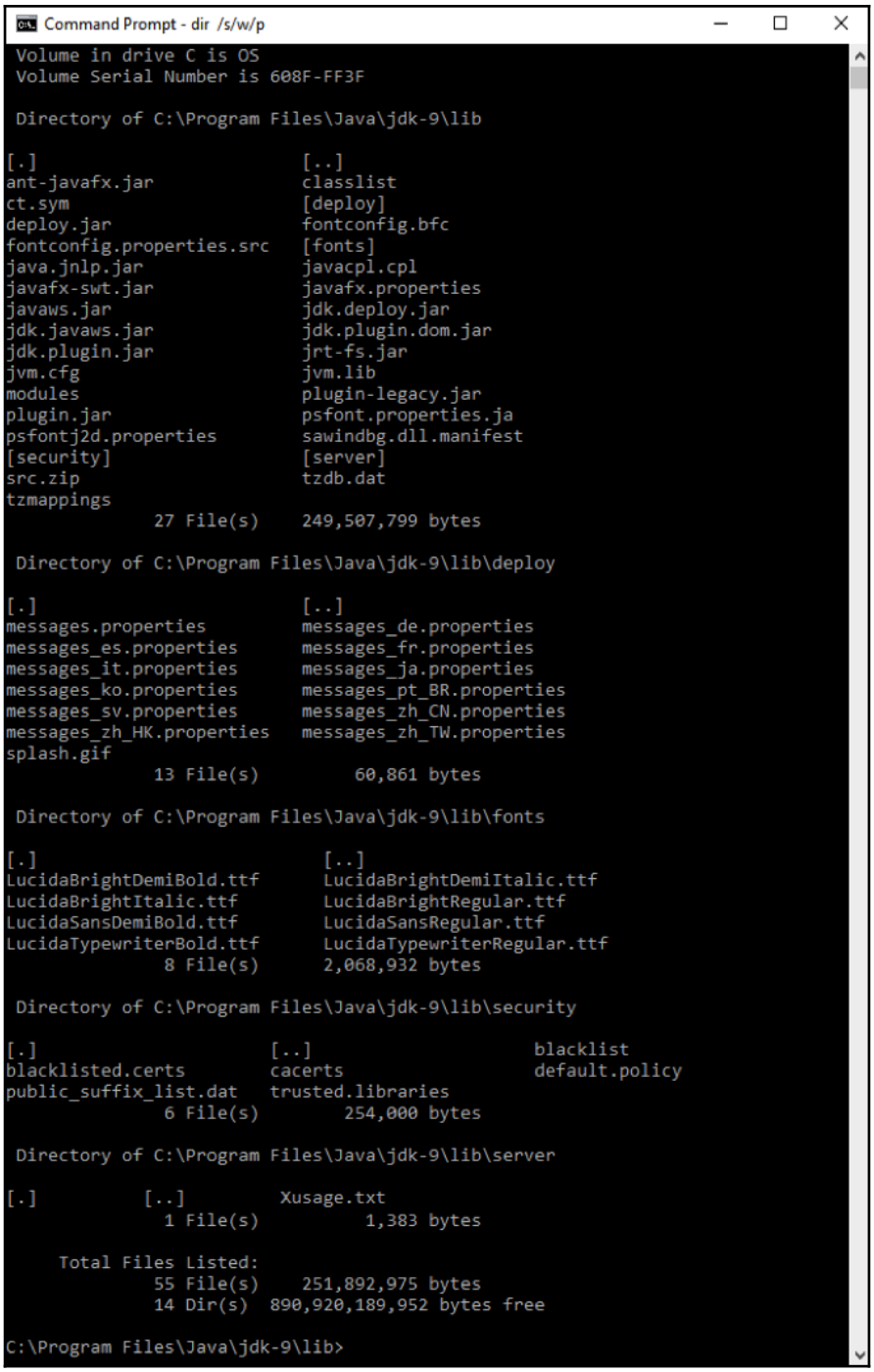

edljr — -bash — 75×6
Edwards-iMac:~ edljr$ javac DependencyTest.Java
error: Class names, 'DependencyTest.Java', are only accepted if annotation
processing is explicitly requested
1 error
Edwards-iMac:~ edljr$

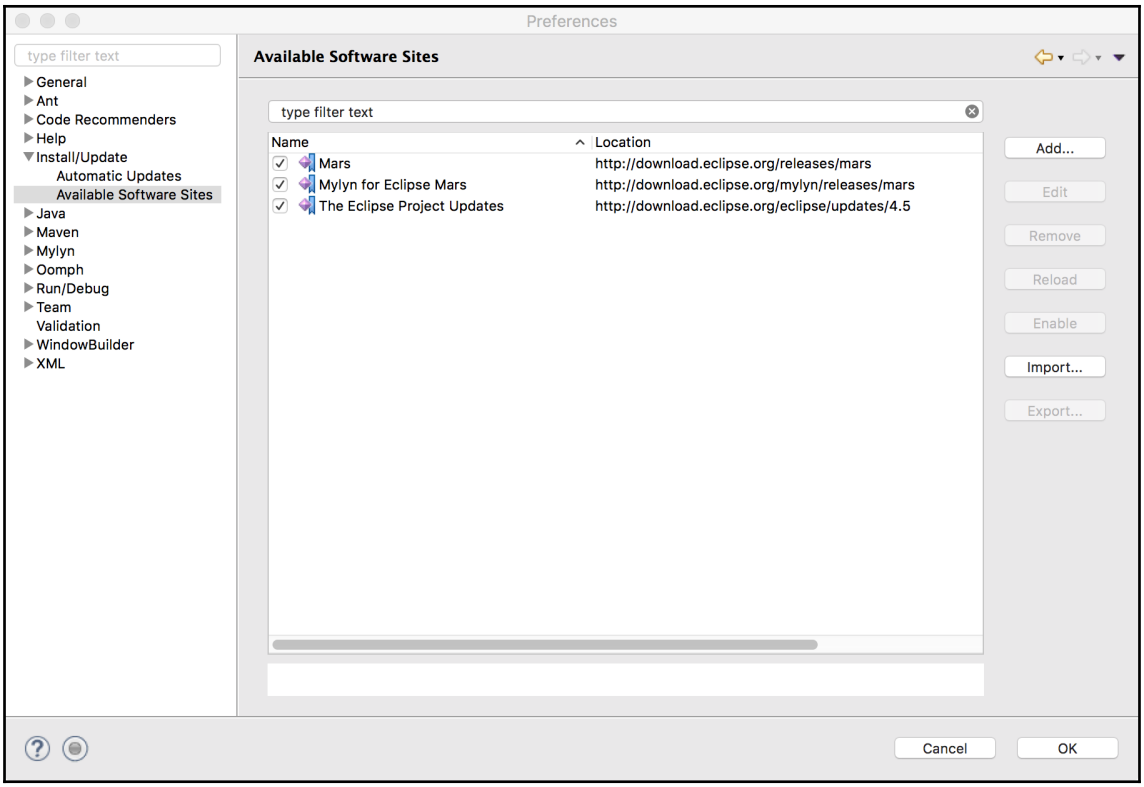

edljr — -bash — 65×8
Last login: Sat Jul 15 15:04:45 on ttys000
Edwards-iMac:~ edljr$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
Edwards-iMac:~ edljr$

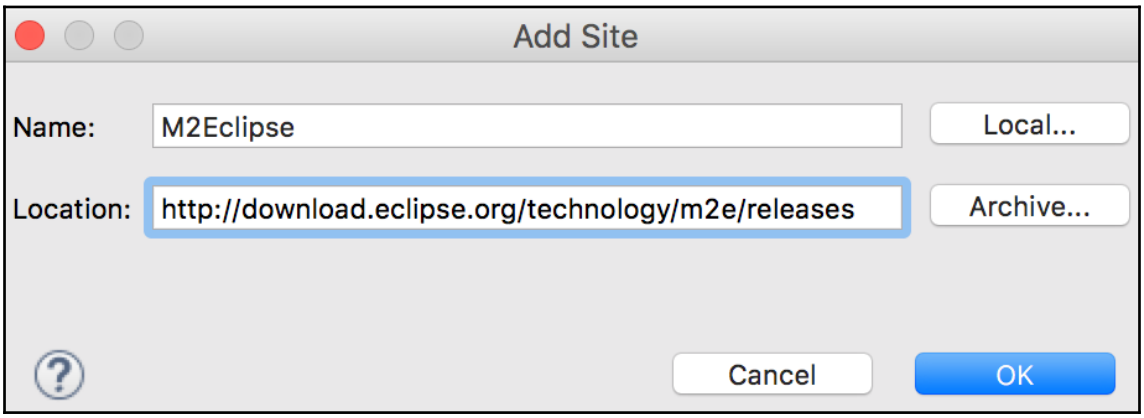

Command Prompt
C:\Users\elavi\Desktop>java -version
java version "9"
Java(TM) SE Runtime Environment (build 9+175)
Java HotSpot(TM) 64-Bit Server VM (build 9+175, mixed mode)
C:\Users\elavi\Desktop>

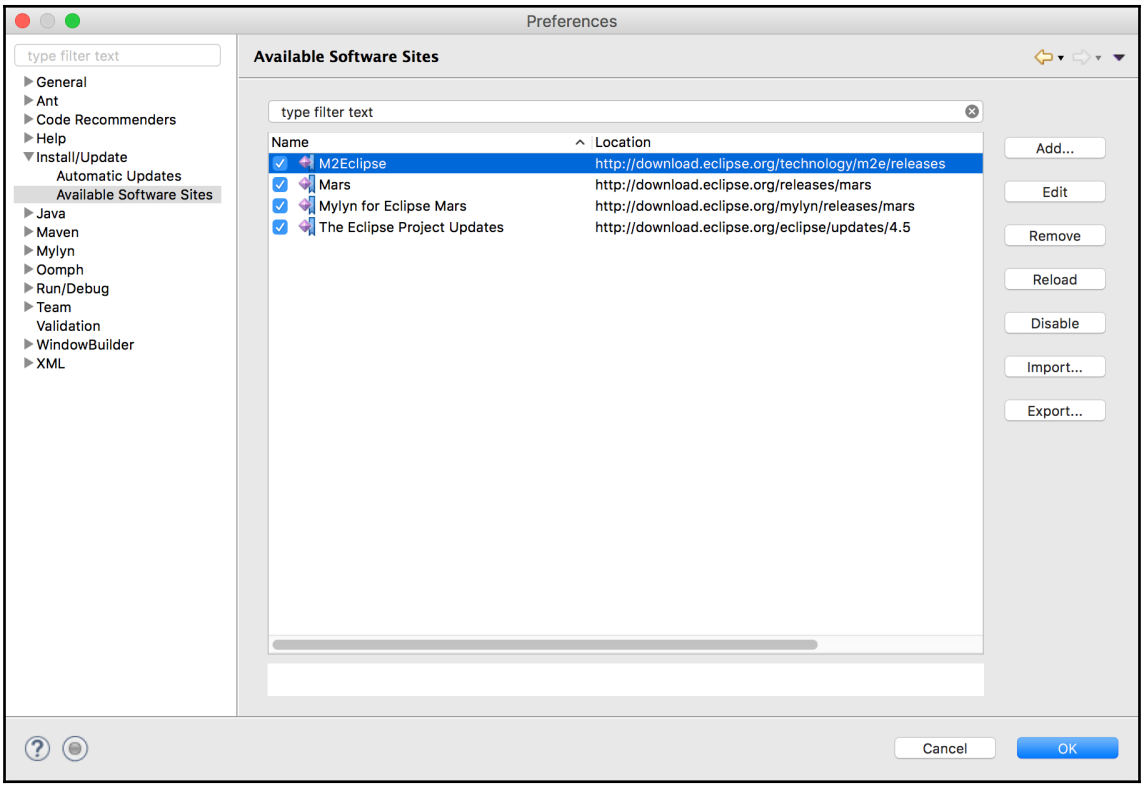

edljr — -bash — 65×8
Last login: Sat Jul 15 15:04:45 on ttys000
Edwards-iMac:~ edljr$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
Edwards-iMac:~ edljr$

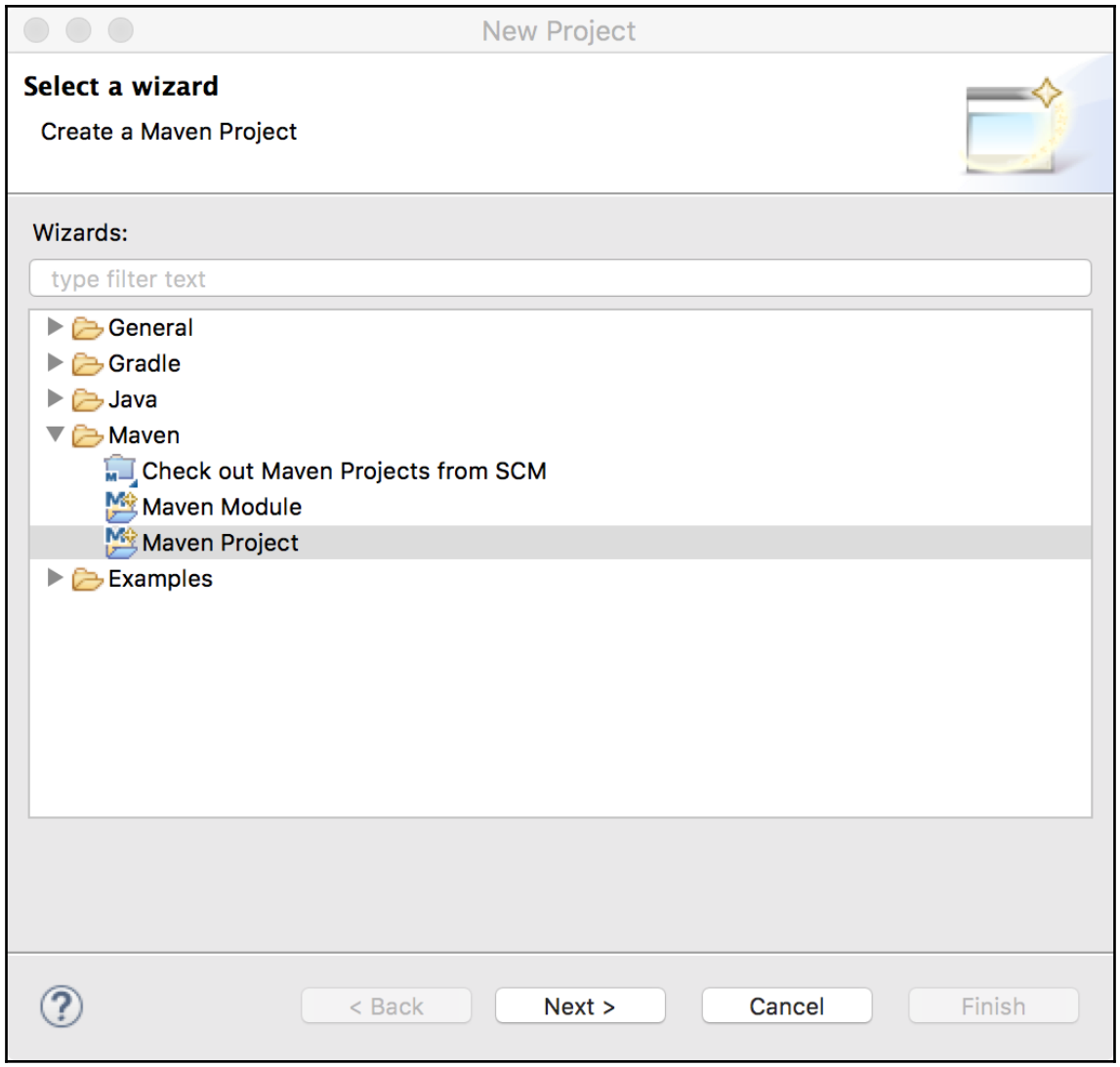

Command Prompt - dir /s/w/p
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\Program Files\Java\jdk-9\bin
[.] [..]
appletviewer.exe attach.dll
awt.dll bci.dll
dcpr.dll decora_sse.dll
deploy.dll [dtplugin]
dt_shmem.dll dt_socket.dll
eula.dll fontmanager.dll
fxplugins.dll glass.dll
glib-lite.dll gstreamer-lite.dll
idlj.exe instrument.dll
j2pcsc.dll j2pkcs11.dll
jaas_nt.dll jabswitch.exe
jaccessinspector.exe jaccesswalker.exe
jar.exe jarsigner.exe
java.dll java.exe
javaaccessbridge.dll javac.exe
javacpl.exe javadoc.exe
javafx_font.dll javafx_font_t2k.dll
javafx_iio.dll javah.exe
javajpeg.dll javap.exe
javapackager.exe javaw.exe
javaws.exe jawt.dll
jcmd.exe jconsole.exe
jdb.exe jdeprscan.exe
jdeps.exe jdwp.dll
jfxmedia.dll jfxwebkit.dll
jhsdb.exe jimage.dll
jimage.exe jinfo.exe
jjs.exe jli.dll
jlink.exe jmap.exe
jmod.exe jp2iexp.dll
jp2native.dll jp2ssv.dll
jps.exe jrunscript.exe
jshell.exe jsound.dll
jsoundds.dll jstack.exe
jstat.exe jstatd.exe
jweblauncher.exe kcms.dll
keytool.exe kinit.exe
klist.exe ktab.exe
lcms.dll le.dll
management.dll management_agent.dll
management_ext.dll mlib_image.dll
msvcp120.dll msvcr120.dll
net.dll nio.dll
orbd.exe pack200.exe
[plugin2] policytool.exe
prefs.dll prism_common.dll
prism_d3d.dll prism_sw.dll
rmi.dll rmic.exe
rmid.exe rmiregistry.exe
sawindbg.dll schemagen.exe
serialver.exe [server]
servertool.exe splashscreen.dll
ssvagent.exe sunec.dll
sunmscapi.dll t2k.dll
tnameserv.exe unpack.dll
unpack200.exe verify.dll
w2k_lsa_auth.dll windowsaccessbridge-64.dll
wsdetect.dll wsgen.exe
wsimport.exe xjc.exe
zip.dll
116 File(s) 56,430,864 bytes
Directory of C:\Program Files\Java\jdk-9\bin\dtplugin
[.] [..] deployJava1.dll
npdeployJava1.dll
2 File(s) 2,209,872 bytes
Directory of C:\Program Files\Java\jdk-9\bin\plugin2
[.] [..] msvcp120.dll msvcr120.dll npjp2.dll
3 File(s) 1,841,000 bytes
Directory of C:\Program Files\Java\jdk-9\bin\server
[.] [..] jvm.dll
1 File(s) 10,332,712 bytes
Total Files Listed:
122 File(s) 70,814,448 bytes
11 Dir(s) 890,921,709,568 bytes free
C:\Program Files\Java\jdk-9\bin>


Command Prompt - dir /s/w/p
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\Program Files\Java\jdk-9\lib
[.] [..]
ant-javafx.jar classlist
ct.sym [deploy]
deploy.jar fontconfig.bfc
fontconfig.properties.src [fonts]
java.jnlp.jar javacpl.cpl
javafx-swt.jar javafx.properties
javaws.jar jdk.deploy.jar
jdk.javaws.jar jdk.plugin.dom.jar
jdk.plugin.jar jrt-fs.jar
jvm.cfg jvm.lib
modules plugin-legacy.jar
plugin.jar psfont.properties.ja
psfontj2d.properties sawindbg.dll.manifest
[security] [server]
src.zip tzdb.dat
tzmappings
27 File(s) 249,507,799 bytes
Directory of C:\Program Files\Java\jdk-9\lib\deploy
[.] [..]
messages.properties messages_de.properties
messages_es.properties messages_fr.properties
messages_it.properties messages_ja.properties
messages_ko.properties messages_pt_BR.properties
messages_sv.properties messages_zh_CN.properties
messages_zh_HK.properties messages_zh_TW.properties
splash.gif
13 File(s) 60,861 bytes
Directory of C:\Program Files\Java\jdk-9\lib\fonts
[.] [..]
LucidaBrightDemiBold.ttf LucidaBrightDemiItalic.ttf
LucidaBrightItalic.ttf LucidaBrightRegular.ttf
LucidaSansDemiBold.ttf LucidaSansRegular.ttf
LucidaTypewriterBold.ttf LucidaTypewriterRegular.ttf
8 File(s) 2,068,932 bytes
Directory of C:\Program Files\Java\jdk-9\lib\security
[.] [..] blacklist
blacklisted.certs cacerts default.policy
public_suffix_list.dat trusted.libraries
6 File(s) 254,000 bytes
Directory of C:\Program Files\Java\jdk-9\lib\server
[.] [..] Xusage.txt
1 File(s) 1,383 bytes
Total Files Listed:
55 File(s) 251,892,975 bytes
14 Dir(s) 890,920,189,952 bytes free
C:\Program Files\Java\jdk-9\lib>

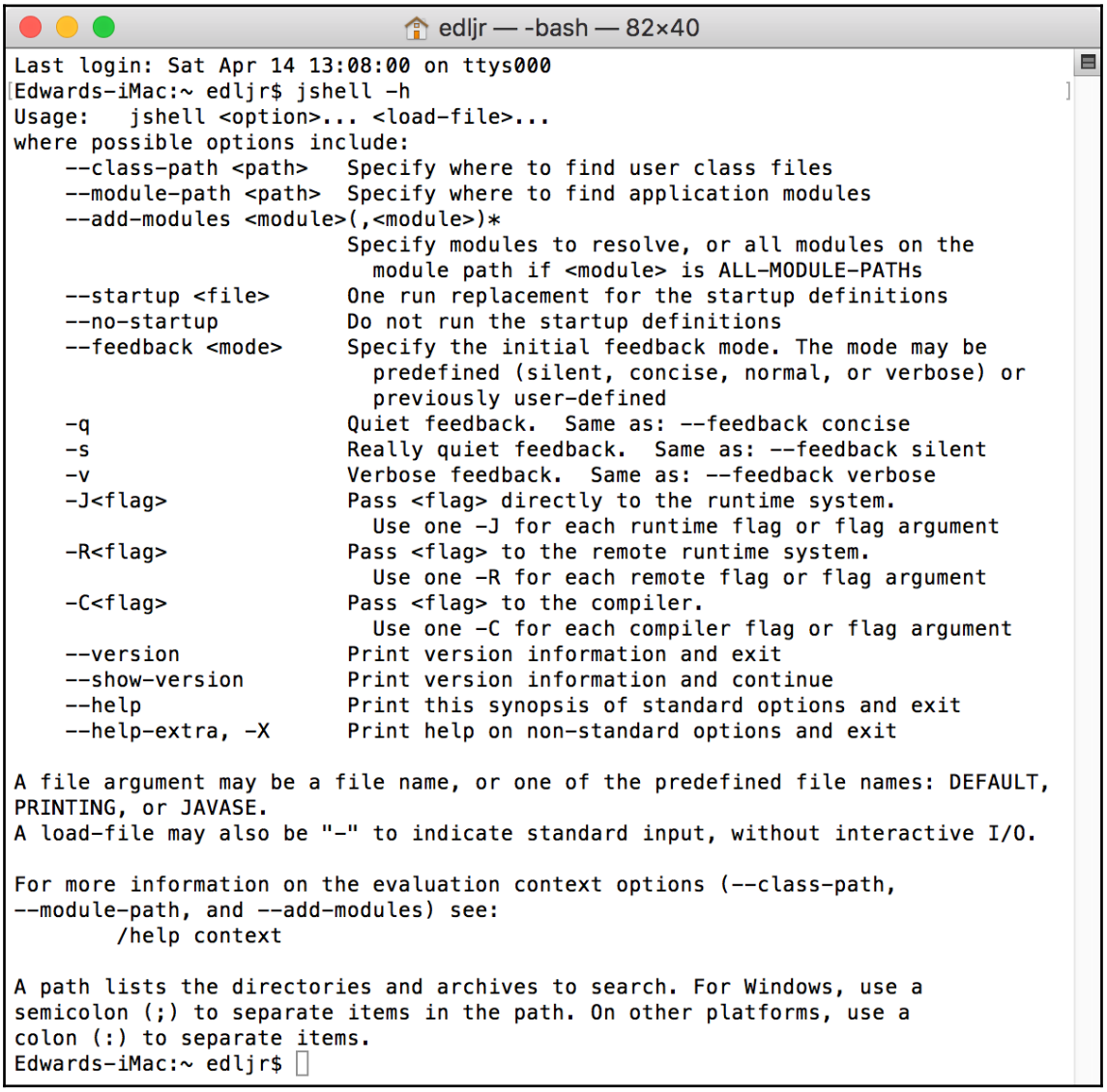

Preferences
type filter text
General
Ant
Code Recommenders
Help
Install/Update
Automatic Updates
Available Software Sites
Java
Maven
Mylyn
Oomph
Run/Debug
Team
Validation
WindowBuilder
XML
Available Software Sites
type filter text
Name
Location
Mars
http://download.eclipse.org/releases/mars
Mylyn for Eclipse Mars
http://download.eclipse.org/mylyn/releases/mars
The Eclipse Project Updates
http://download.eclipse.org/eclipse/updates/4.5
Add...
Edit
Remove
Reload
Enable
Import...
Export...
Cancel
OK

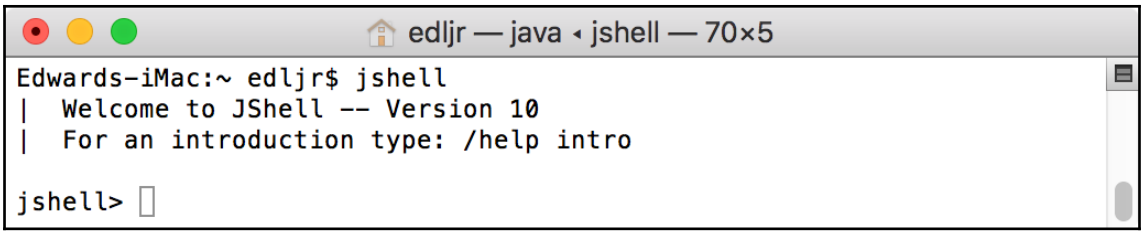

Add Site
Name:
M2Eclipse
Local...
Location:
http://download.eclipse.org/technology/m2e/releases
Archive...
Cancel
OK

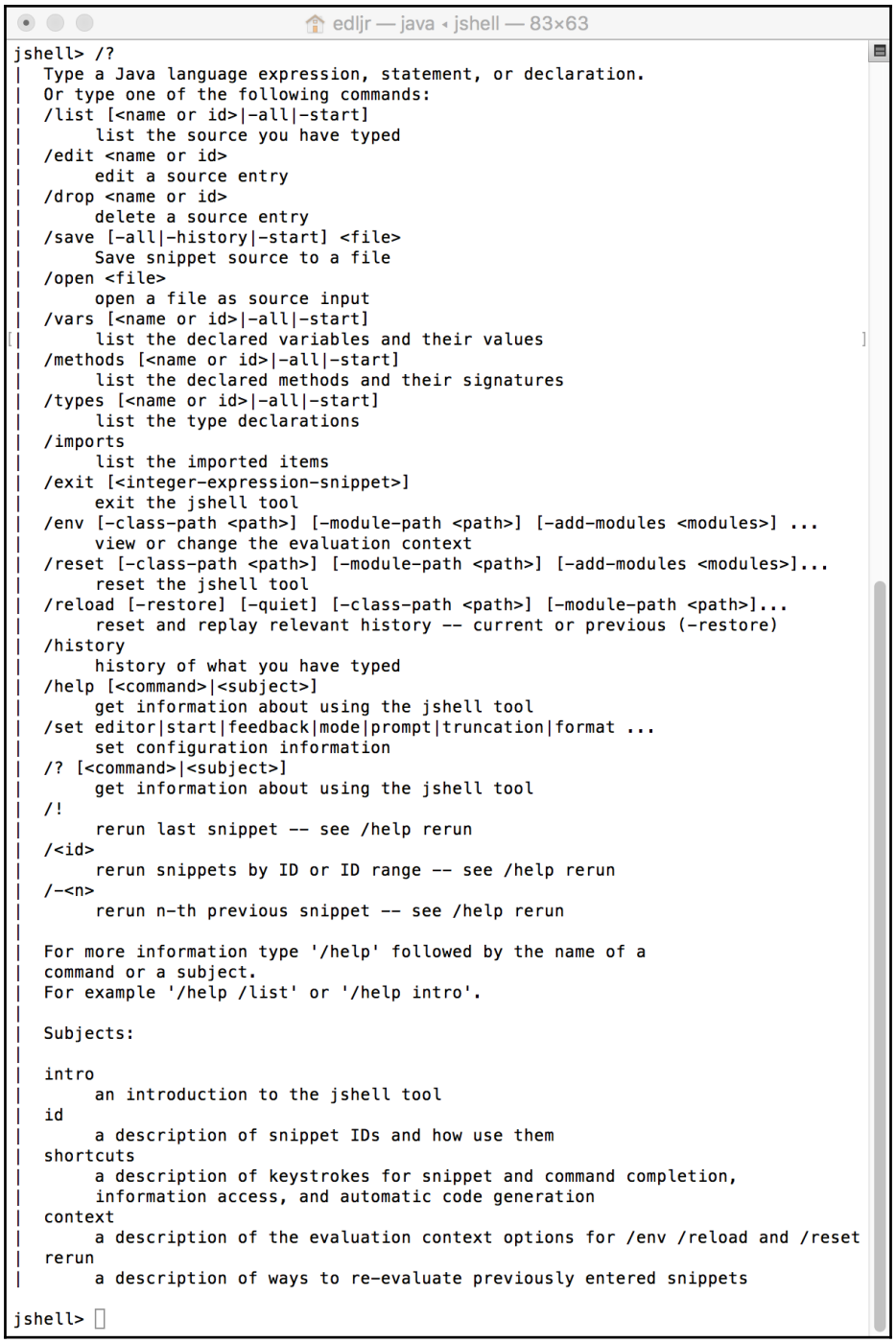

Preferences
type filter text
General
Ant
Code Recommenders
Help
Install/Update
Automatic Updates
Available Software Sites
Java
Maven
Mylyn
Oomph
Run/Debug
Team
Validation
WindowBuilder
XML
Available Software Sites
type filter text
Name
Location
M2Eclipse
http://download.eclipse.org/technology/m2e/releases
Mars
http://download.eclipse.org/releases/mars
Mylyn for Eclipse Mars
http://download.eclipse.org/mylyn/releases/mars
The Eclipse Project Updates
http://download.eclipse.org/eclipse/updates/4.5
Add...
Edit
Remove
Reload
Disable
Import...
Export...
Cancel
OK

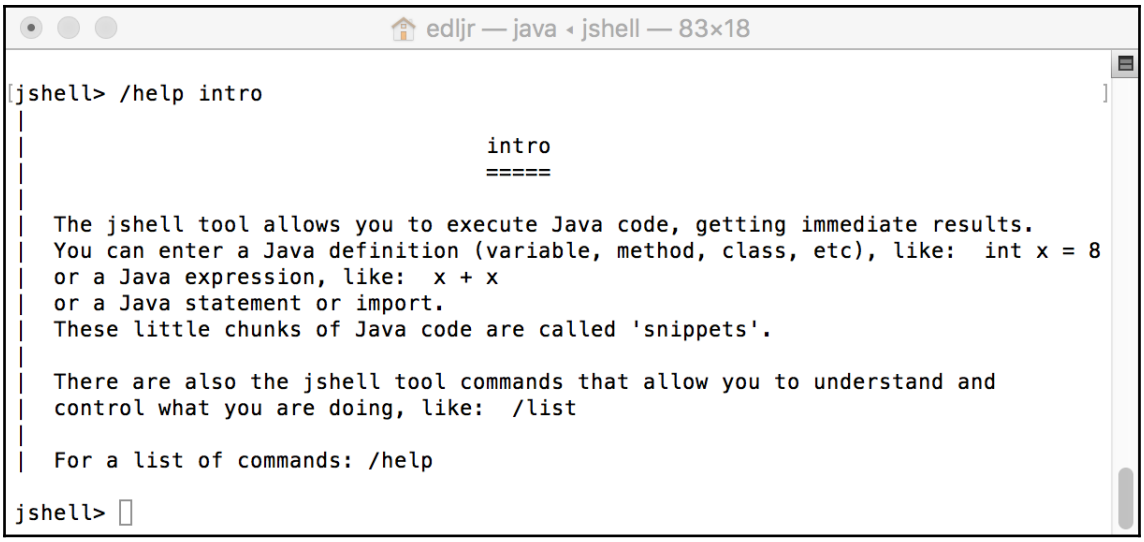

New Project
Select a wizard
Create a Maven Project
Wizards:
type filter text
General
Gradle
Java
Maven
Check out Maven Projects from SCM
Maven Module
Maven Project
Examples
< Back
Next >
Cancel
Finish

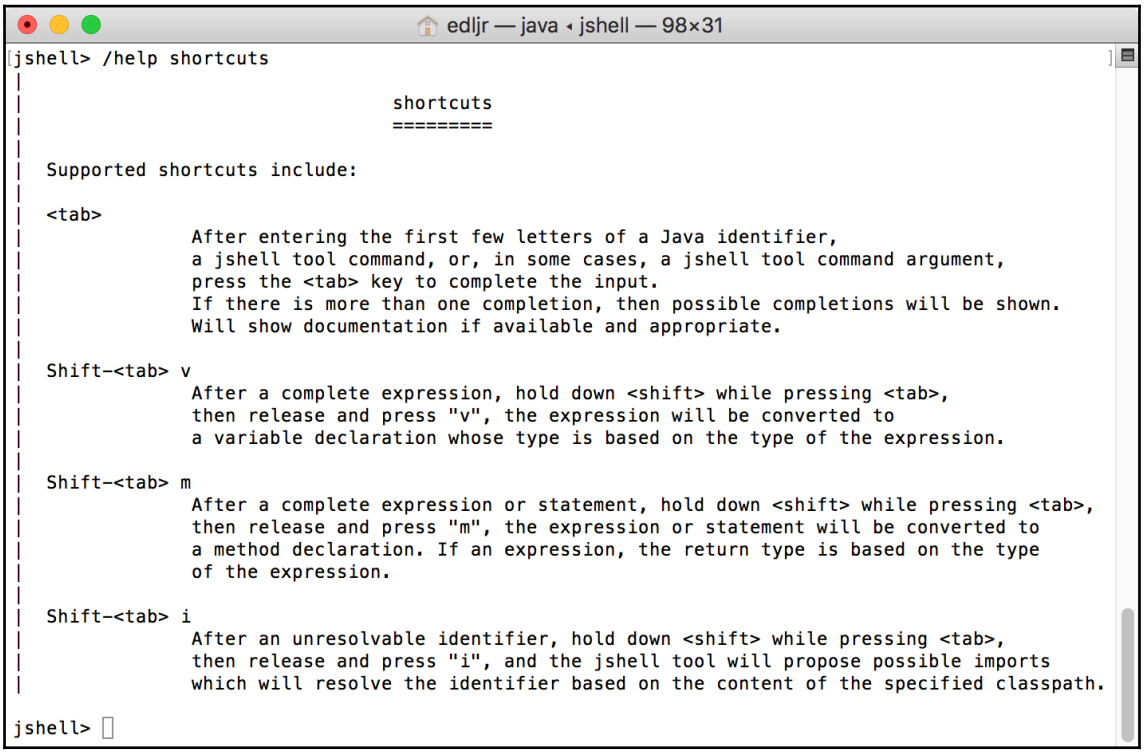
Chapter 6: Experimenting with the Java Shell

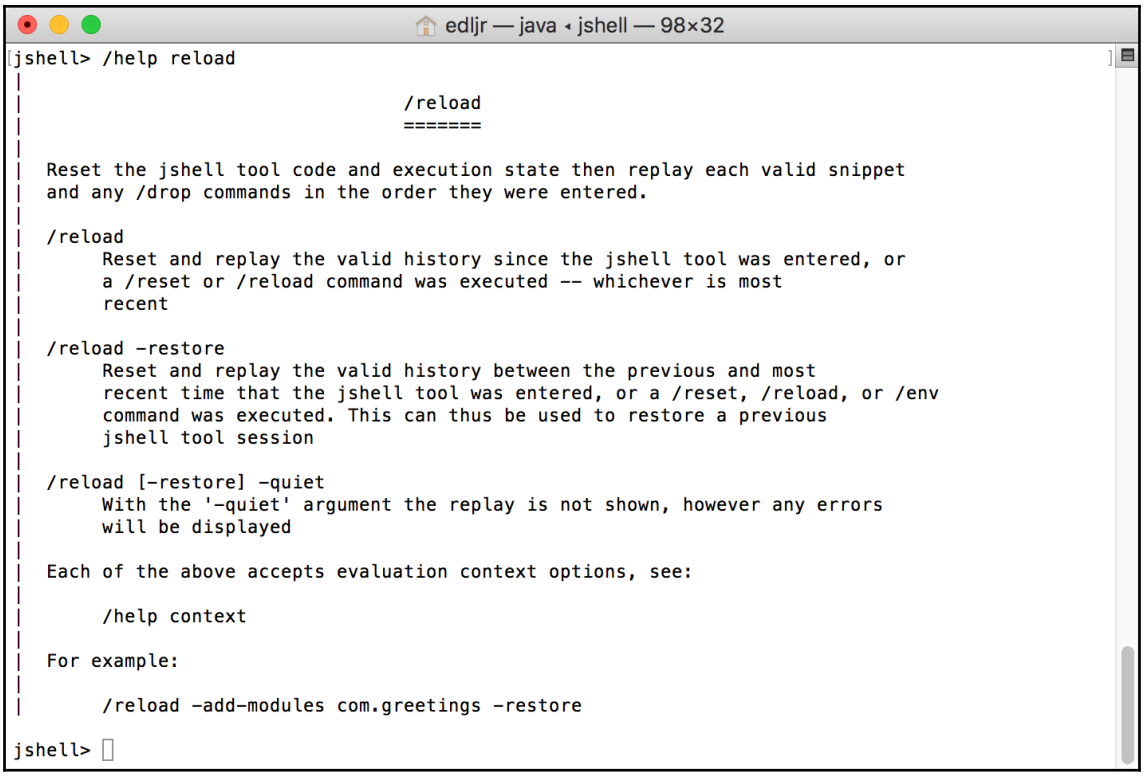


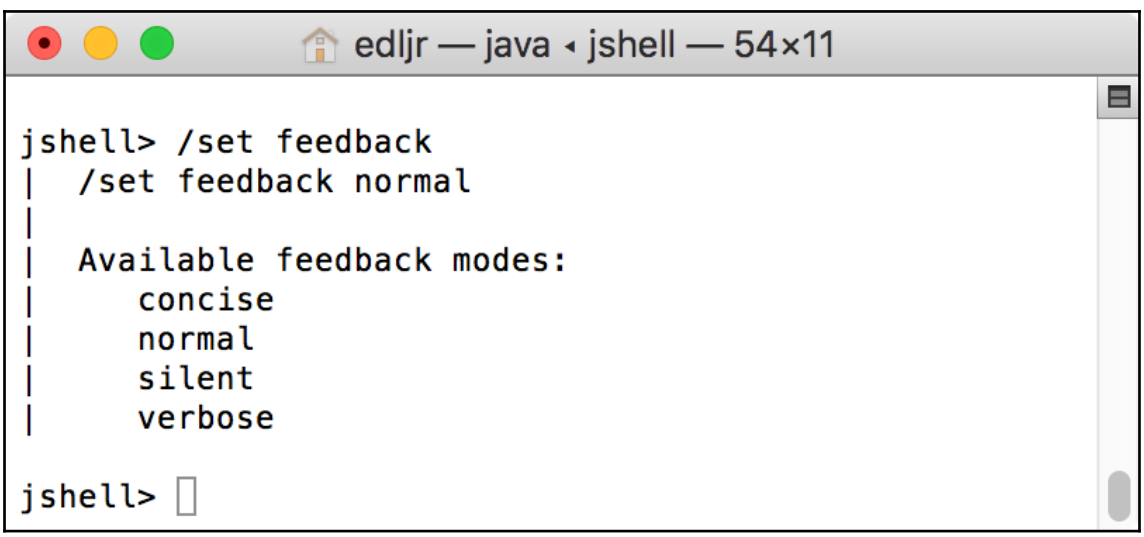

edljr — java ◂ jshell — 70×5
Edwards-iMac:~ edljr$ jshell
| Welcome to JShell -- Version 10
| For an introduction type: /help intro
jshell>

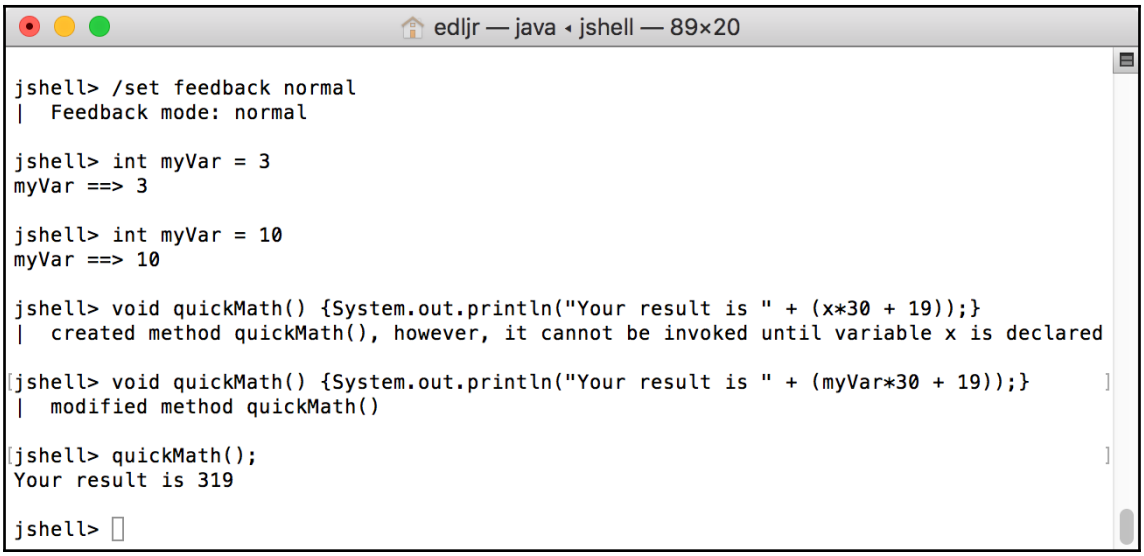

edljr — java ◂ jshell — 83×63
jshell> /?
| Type a Java language expression, statement, or declaration.
| Or type one of the following commands:
| /list [<name or id>|-all|-start]
| list the source you have typed
| /edit <name or id>
| edit a source entry
| /drop <name or id>
| delete a source entry
| /save [-all|-history|-start] <file>
| Save snippet source to a file
| /open <file>
| open a file as source input
| /vars [<name or id>|-all|-start]
| list the declared variables and their values
| /methods [<name or id>|-all|-start]
| list the declared methods and their signatures
| /types [<name or id>|-all|-start]
| list the type declarations
| /imports
| list the imported items
| /exit [<integer-expression-snippet>]
| exit the jshell tool
| /env [-class-path <path>] [-module-path <path>] [-add-modules <modules>] ...
| view or change the evaluation context
| /reset [-class-path <path>] [-module-path <path>] [-add-modules <modules>]...
| reset the jshell tool
| /reload [-restore] [-quiet] [-class-path <path>] [-module-path <path>]...
| reset and replay relevant history -- current or previous (-restore)
| /history
| history of what you have typed
| /help [<command>|<subject>]
| get information about using the jshell tool
| /set editor|start|feedback|mode|prompt|truncation|format ...
| set configuration information
| /? [<command>|<subject>]
| get information about using the jshell tool
| /!
| rerun last snippet -- see /help rerun
| /<id>
| rerun snippets by ID or ID range -- see /help rerun
| /-<n>
| rerun n-th previous snippet -- see /help rerun
|
| For more information type '/help' followed by the name of a
| command or a subject.
| For example '/help /list' or '/help intro'.
|
| Subjects:
|
| intro
| an introduction to the jshell tool
| id
| a description of snippet IDs and how use them
| shortcuts
| a description of keystrokes for snippet and command completion,
| information access, and automatic code generation
| context
| a description of the evaluation context options for /env /reload and /reset
| rerun
| a description of ways to re-evaluate previously entered snippets
jshell>

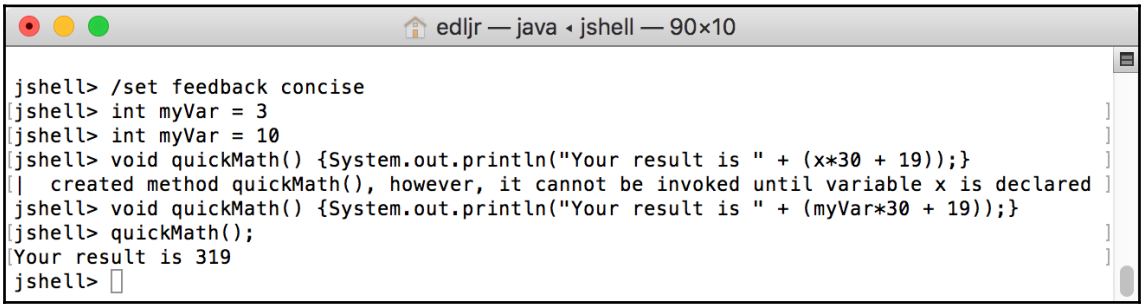

edljr — java ◂ jshell — 83×18
jshell> /help intro
intro
=====
The jshell tool allows you to execute Java code, getting immediate results.
You can enter a Java definition (variable, method, class, etc), like: int x = 8
or a Java expression, like: x + x
or a Java statement or import.
These little chunks of Java code are called 'snippets'.
There are also the jshell tool commands that allow you to understand and
control what you are doing, like: /list
For a list of commands: /help
jshell>

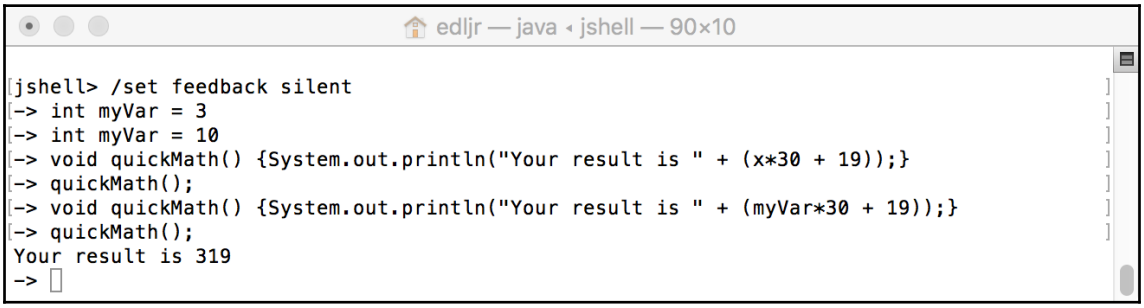

edljr — java ◂ jshell — 98×31
jshell> /help shortcuts
shortcuts
=========
Supported shortcuts include:
<tab>
After entering the first few letters of a Java identifier,
a jshell tool command, or, in some cases, a jshell tool command argument,
press the <tab> key to complete the input.
If there is more than one completion, then possible completions will be shown.
Will show documentation if available and appropriate.
Shift-<tab> v
After a complete expression, hold down <shift> while pressing <tab>,
then release and press "v", the expression will be converted to
a variable declaration whose type is based on the type of the expression.
Shift-<tab> m
After a complete expression or statement, hold down <shift> while pressing <tab>,
then release and press "m", the expression or statement will be converted to
a method declaration. If an expression, the return type is based on the type
of the expression.
Shift-<tab> i
After an unresolvable identifier, hold down <shift> while pressing <tab>,
then release and press "i", and the jshell tool will propose possible imports
which will resolve the identifier based on the content of the specified classpath.
jshell>

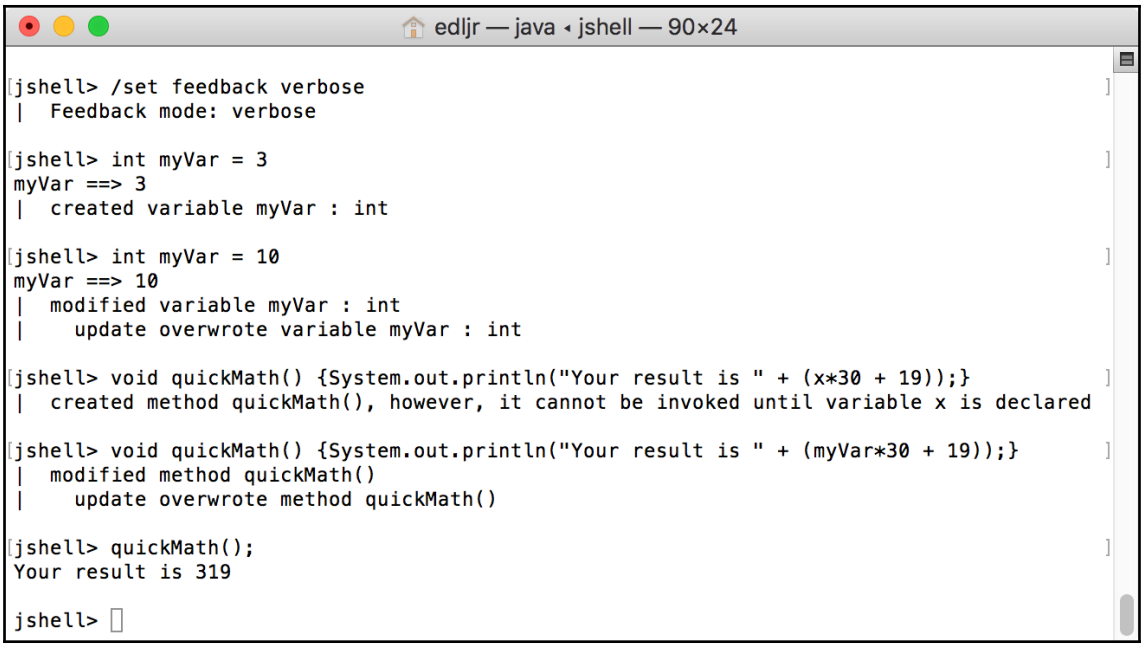

edljr — java ◂ jshell — 98×32
jshell> /help reload
/reload
=======
Reset the jshell tool code and execution state then replay each valid snippet
and any /drop commands in the order they were entered.
/reload
Reset and replay the valid history since the jshell tool was entered, or
a /reset or /reload command was executed -- whichever is most
recent
/reload -restore
Reset and replay the valid history between the previous and most
recent time that the jshell tool was entered, or a /reset, /reload, or /env
command was executed. This can thus be used to restore a previous
jshell tool session
/reload [-restore] -quiet
With the '-quiet' argument the replay is not shown, however any errors
will be displayed
Each of the above accepts evaluation context options, see:
/help context
For example:
/reload -add-modules com.greetings -restore
jshell>

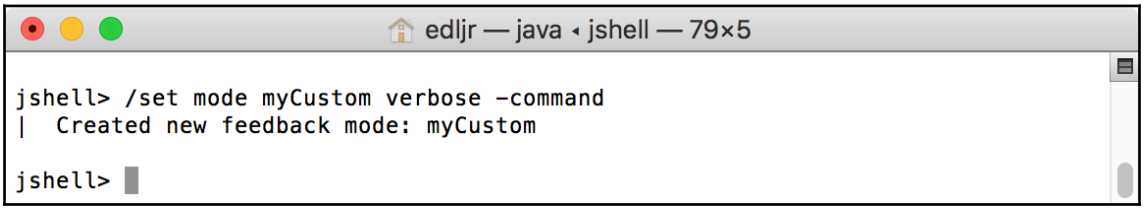

edljr — java ◂ jshell — 54×11
jshell> /set feedback
/set feedback normal
Available feedback modes:
concise
normal
silent
verbose
jshell>

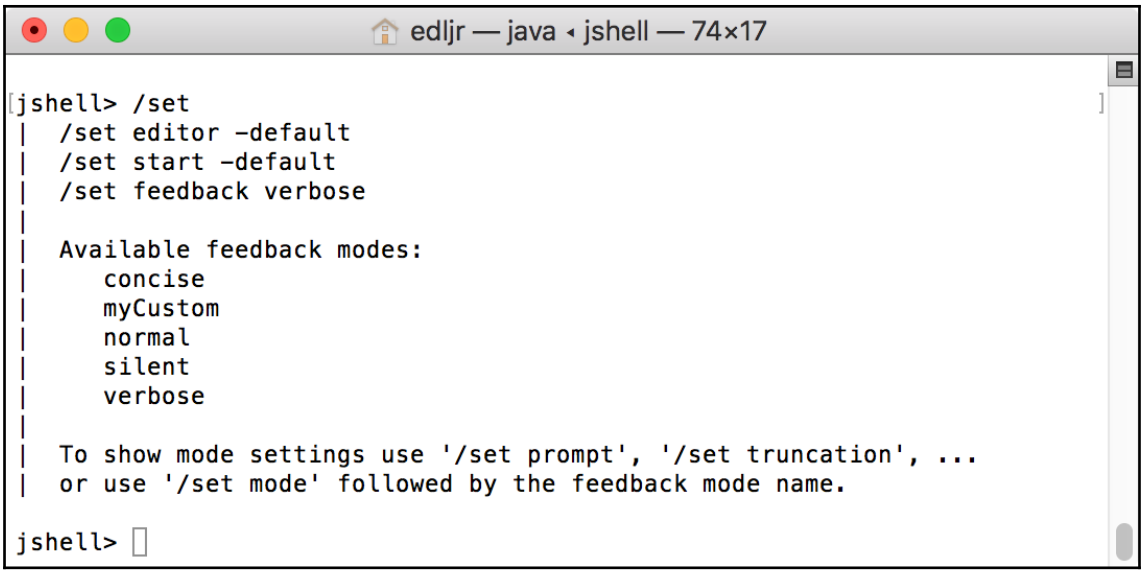

edljr — java ◂ jshell — 89×20
jshell> /set feedback normal
| Feedback mode: normal
jshell> int myVar = 3
myVar ==> 3
jshell> int myVar = 10
myVar ==> 10
jshell> void quickMath() {System.out.println("Your result is " + (x*30 + 19));}
| created method quickMath(), however, it cannot be invoked until variable x is declared
jshell> void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
| modified method quickMath()
jshell> quickMath();
Your result is 319
jshell>

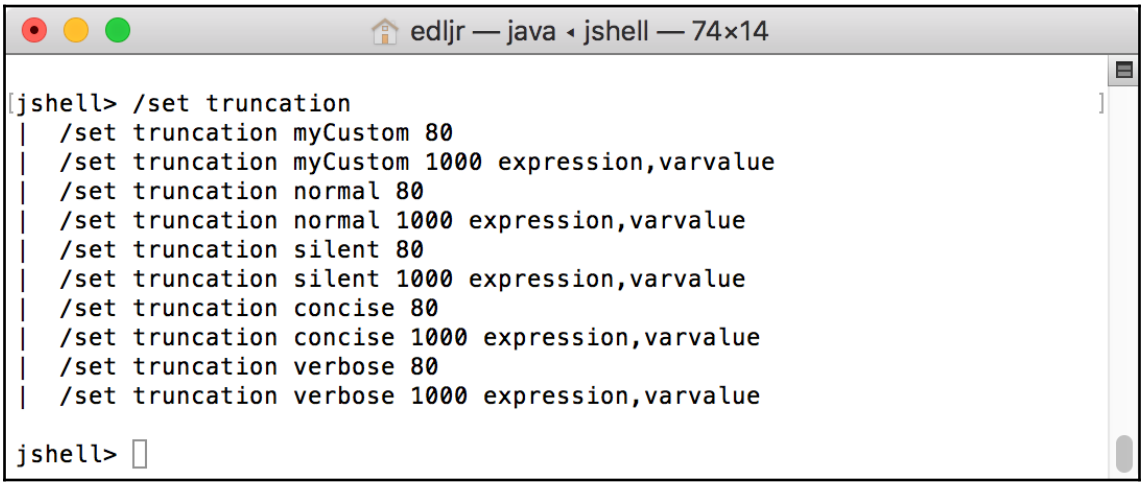

edljr — java ◂ jshell — 90×10
jshell> /set feedback concise
jshell> int myVar = 3
jshell> int myVar = 10
jshell> void quickMath() {System.out.println("Your result is " + (x*30 + 19));}
| created method quickMath(), however, it cannot be invoked until variable x is declared
jshell> void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
jshell> quickMath();
Your result is 319
jshell>

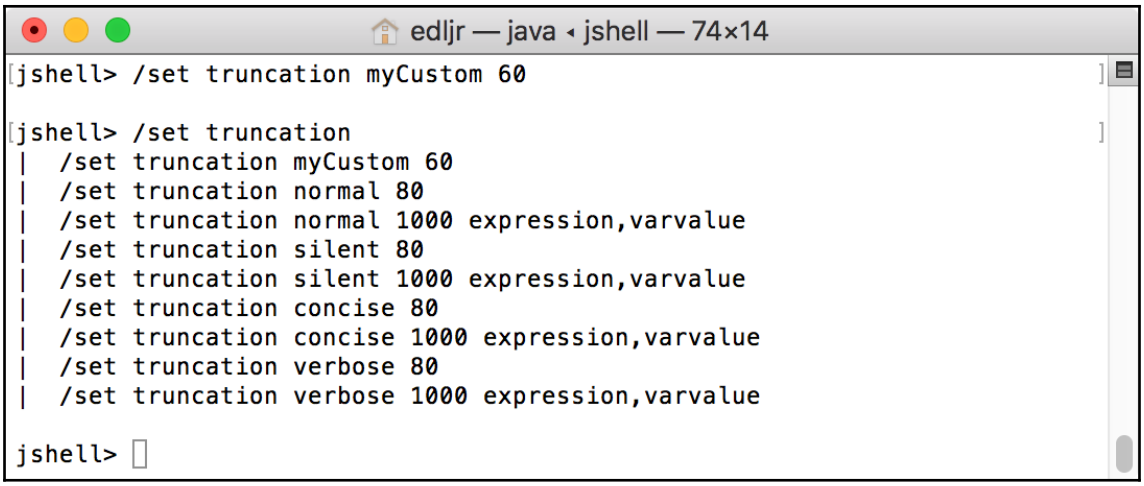

edljr — java ◂ jshell — 90×10
jshell> /set feedback silent
-> int myVar = 3
-> int myVar = 10
-> void quickMath() {System.out.println("Your result is " + (x*30 + 19));}
-> quickMath();
-> void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
-> quickMath();
Your result is 319
->

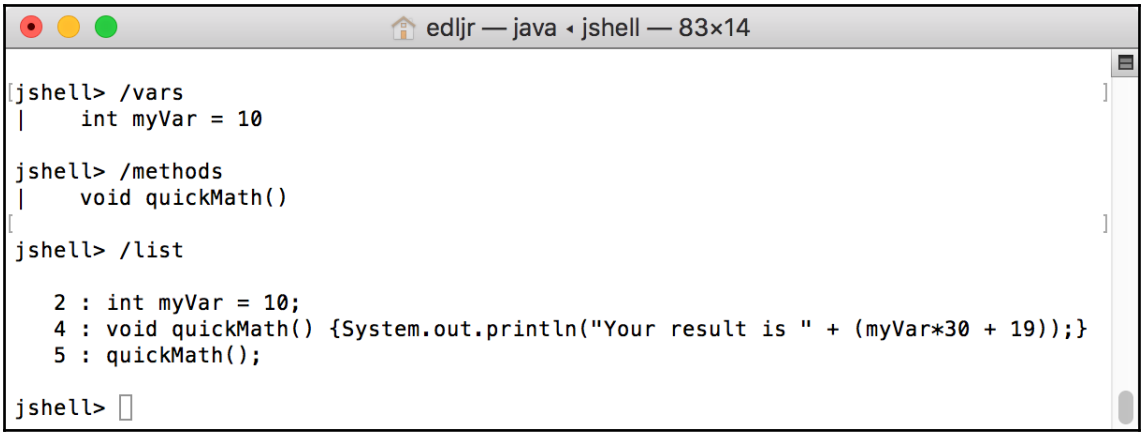

edljr — java ◂ jshell — 90×24
jshell> /set feedback verbose
| Feedback mode: verbose
jshell> int myVar = 3
myVar ==> 3
| created variable myVar : int
jshell> int myVar = 10
myVar ==> 10
| modified variable myVar : int
| update overwrote variable myVar : int
jshell> void quickMath() {System.out.println("Your result is " + (x*30 + 19));}
| created method quickMath(), however, it cannot be invoked until variable x is declared
jshell> void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
| modified method quickMath()
| update overwrote method quickMath()
jshell> quickMath();
Your result is 319
jshell>

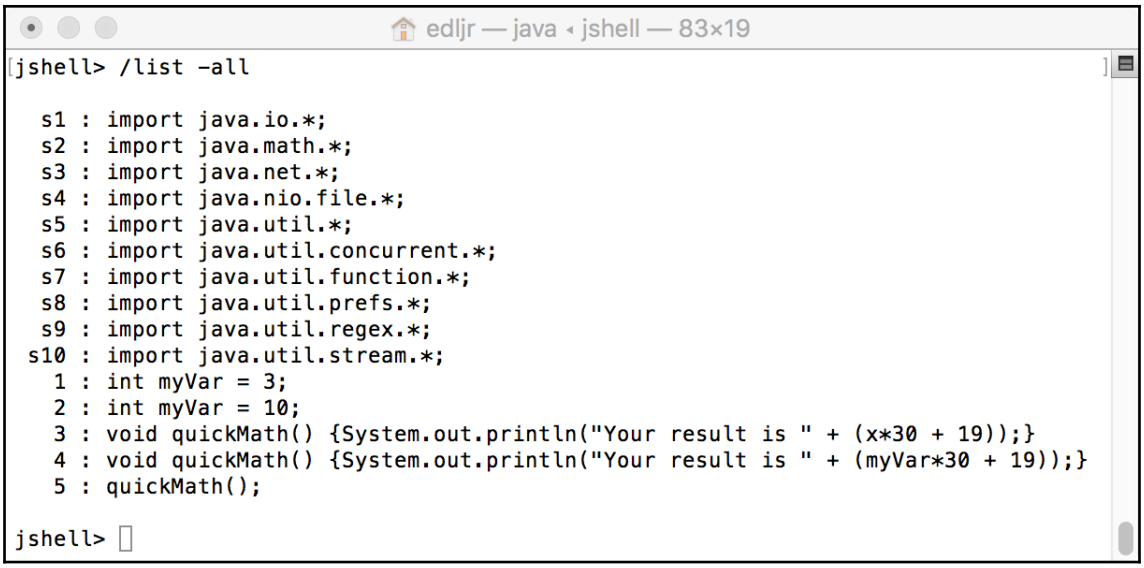

edljr — java ◂ jshell — 79×5
jshell> /set mode myCustom verbose -command
| Created new feedback mode: myCustom
jshell>

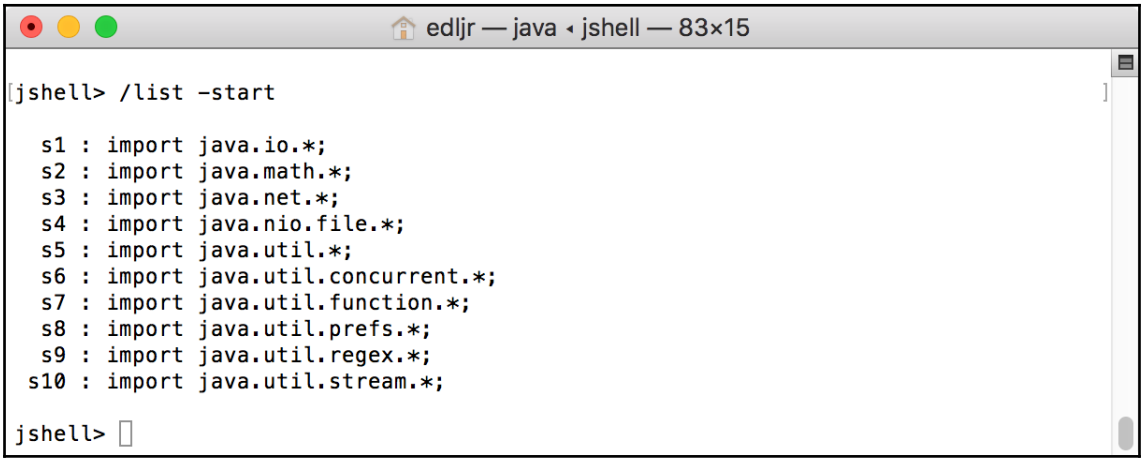

edljr — java ◂ jshell — 74×17
jshell> /set
| /set editor -default
| /set start -default
| /set feedback verbose
|
| Available feedback modes:
| concise
| myCustom
| normal
| silent
| verbose
|
| To show mode settings use '/set prompt', '/set truncation', ...
| or use '/set mode' followed by the feedback mode name.
jshell>

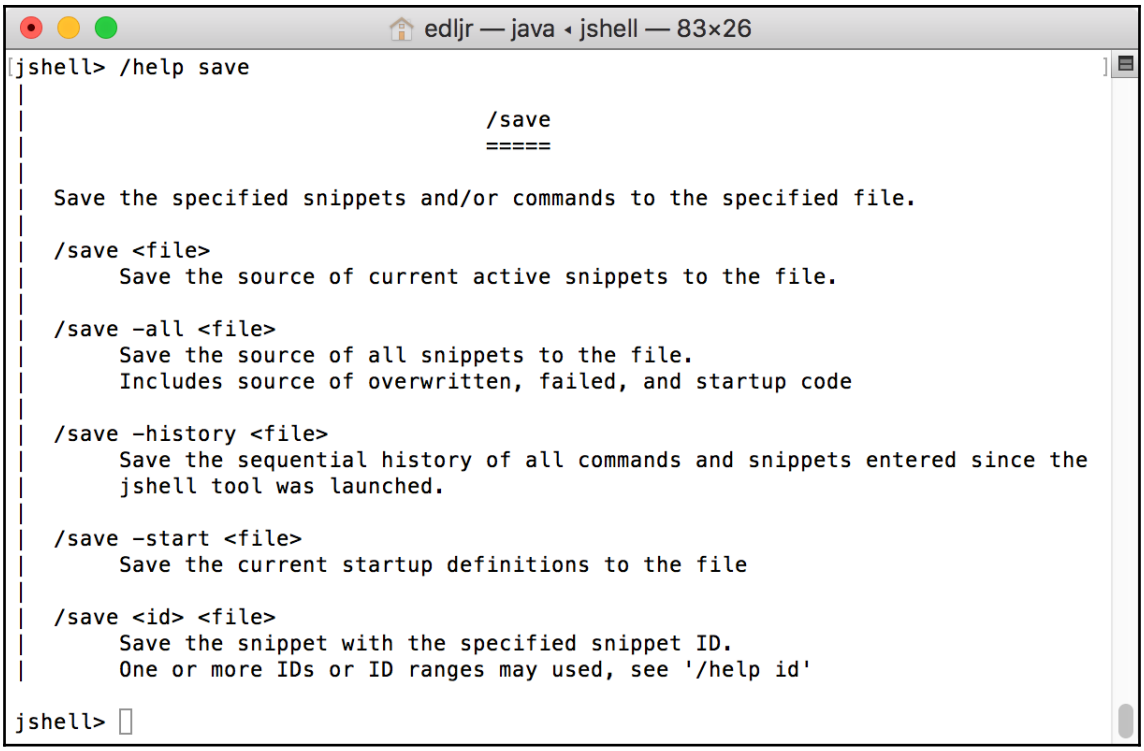

edljr — java ◂ jshell — 74×14
jshell> /set truncation
| /set truncation myCustom 80
| /set truncation myCustom 1000 expression,varvalue
| /set truncation normal 80
| /set truncation normal 1000 expression,varvalue
| /set truncation silent 80
| /set truncation silent 1000 expression,varvalue
| /set truncation concise 80
| /set truncation concise 1000 expression,varvalue
| /set truncation verbose 80
| /set truncation verbose 1000 expression,varvalue
jshell>


edljr — java ◂ jshell — 74×14
jshell> /set truncation myCustom 60
jshell> /set truncation
| /set truncation myCustom 60
| /set truncation normal 80
| /set truncation normal 1000 expression,varvalue
| /set truncation silent 80
| /set truncation silent 1000 expression,varvalue
| /set truncation concise 80
| /set truncation concise 1000 expression,varvalue
| /set truncation verbose 80
| /set truncation verbose 1000 expression,varvalue
jshell>


edljr — java ◂ jshell — 83×14
jshell> /vars
| int myVar = 10
jshell> /methods
| void quickMath()
jshell> /list
2 : int myVar = 10;
4 : void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
5 : quickMath();
jshell>


edljr — java ◂ jshell — 83×19
jshell> /list -all
s1 : import java.io.*;
s2 : import java.math.*;
s3 : import java.net.*;
s4 : import java.nio.file.*;
s5 : import java.util.*;
s6 : import java.util.concurrent.*;
s7 : import java.util.function.*;
s8 : import java.util.prefs.*;
s9 : import java.util.regex.*;
s10 : import java.util.stream.*;
1 : int myVar = 3;
2 : int myVar = 10;
3 : void quickMath() {System.out.println("Your result is " + (x*30 + 19));}
4 : void quickMath() {System.out.println("Your result is " + (myVar*30 + 19));}
5 : quickMath();
jshell>

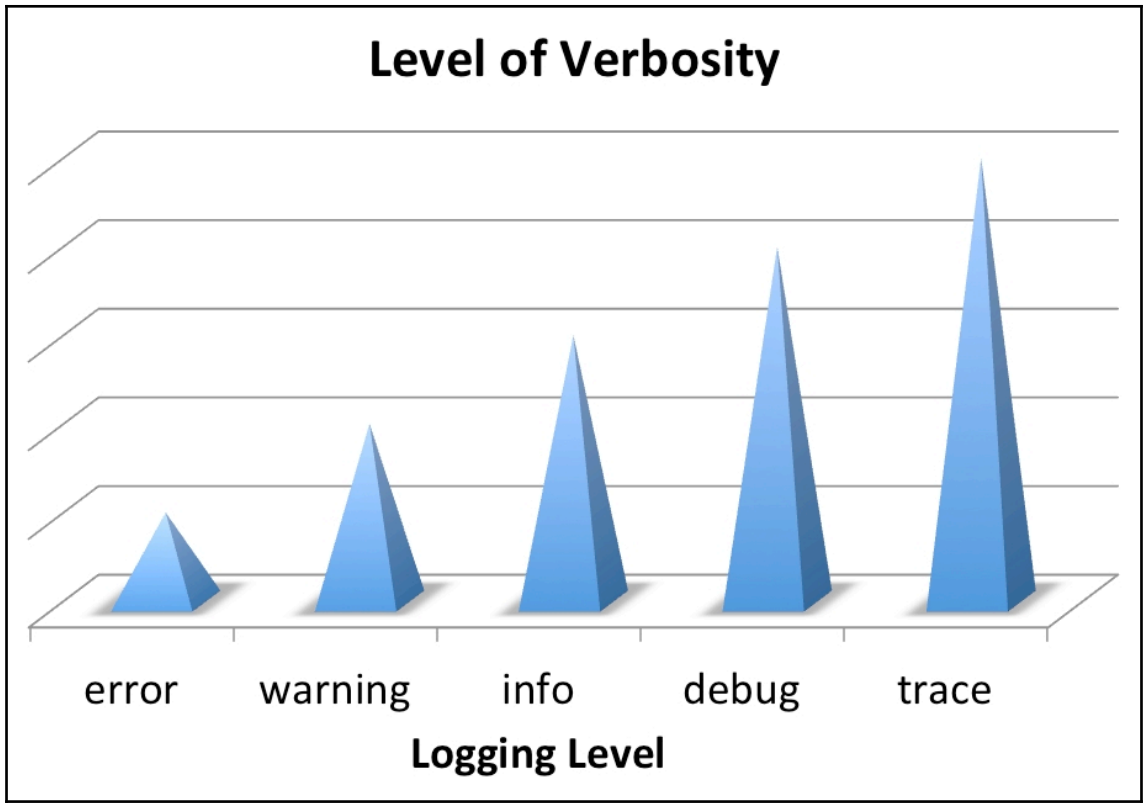

edljr — java ◂ jshell — 83×15
jshell> /list -start
s1 : import java.io.*;
s2 : import java.math.*;
s3 : import java.net.*;
s4 : import java.nio.file.*;
s5 : import java.util.*;
s6 : import java.util.concurrent.*;
s7 : import java.util.function.*;
s8 : import java.util.prefs.*;
s9 : import java.util.regex.*;
s10 : import java.util.stream.*;
jshell>


edljr — java ◂ jshell — 83×26
jshell> /help save
/save
=====
Save the specified snippets and/or commands to the specified file.
/save <file>
Save the source of current active snippets to the file.
/save -all <file>
Save the source of all snippets to the file.
Includes source of overwritten, failed, and startup code
/save -history <file>
Save the sequential history of all commands and snippets entered since the
jshell tool was launched.
/save -start <file>
Save the current startup definitions to the file
/save <id> <file>
Save the snippet with the specified snippet ID.
One or more IDs or ID ranges may used, see '/help id'
jshell>

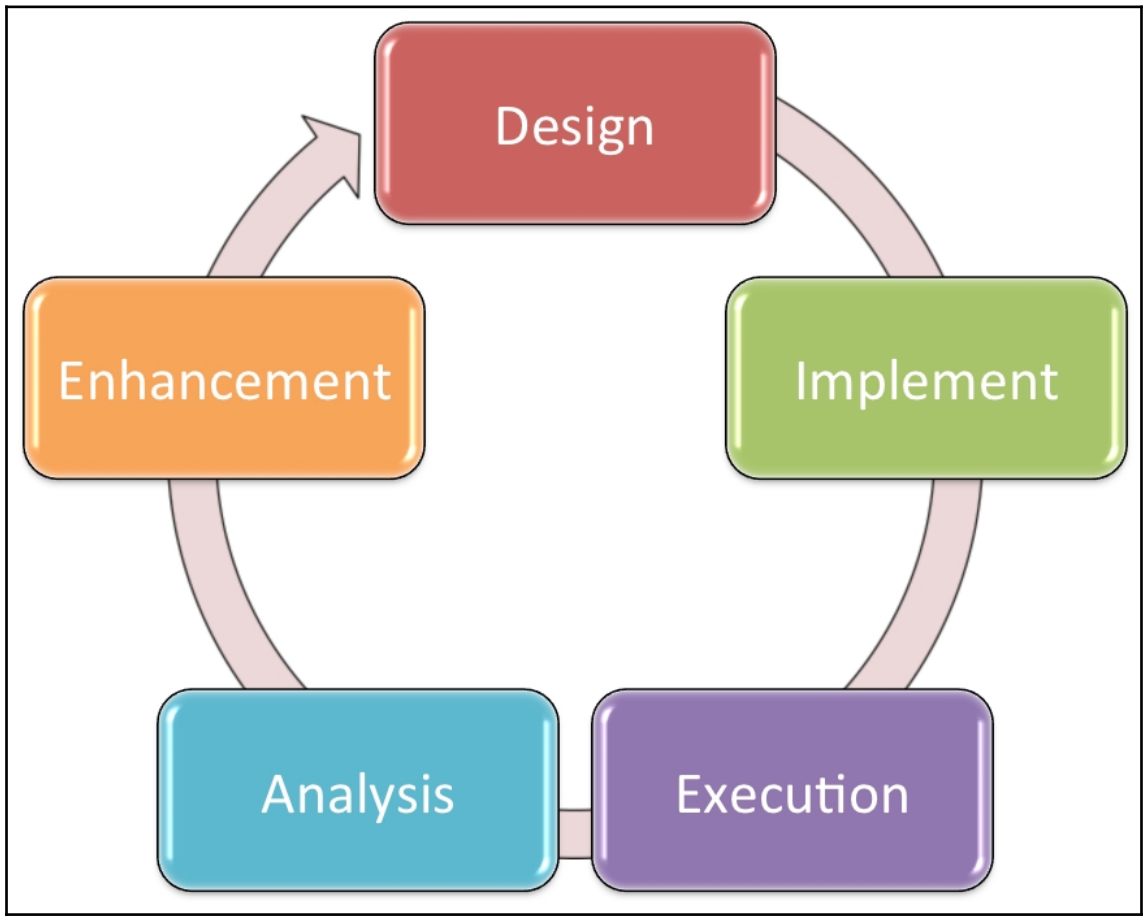
Chapter 7: Leveraging the Default G1 Garbage Collector

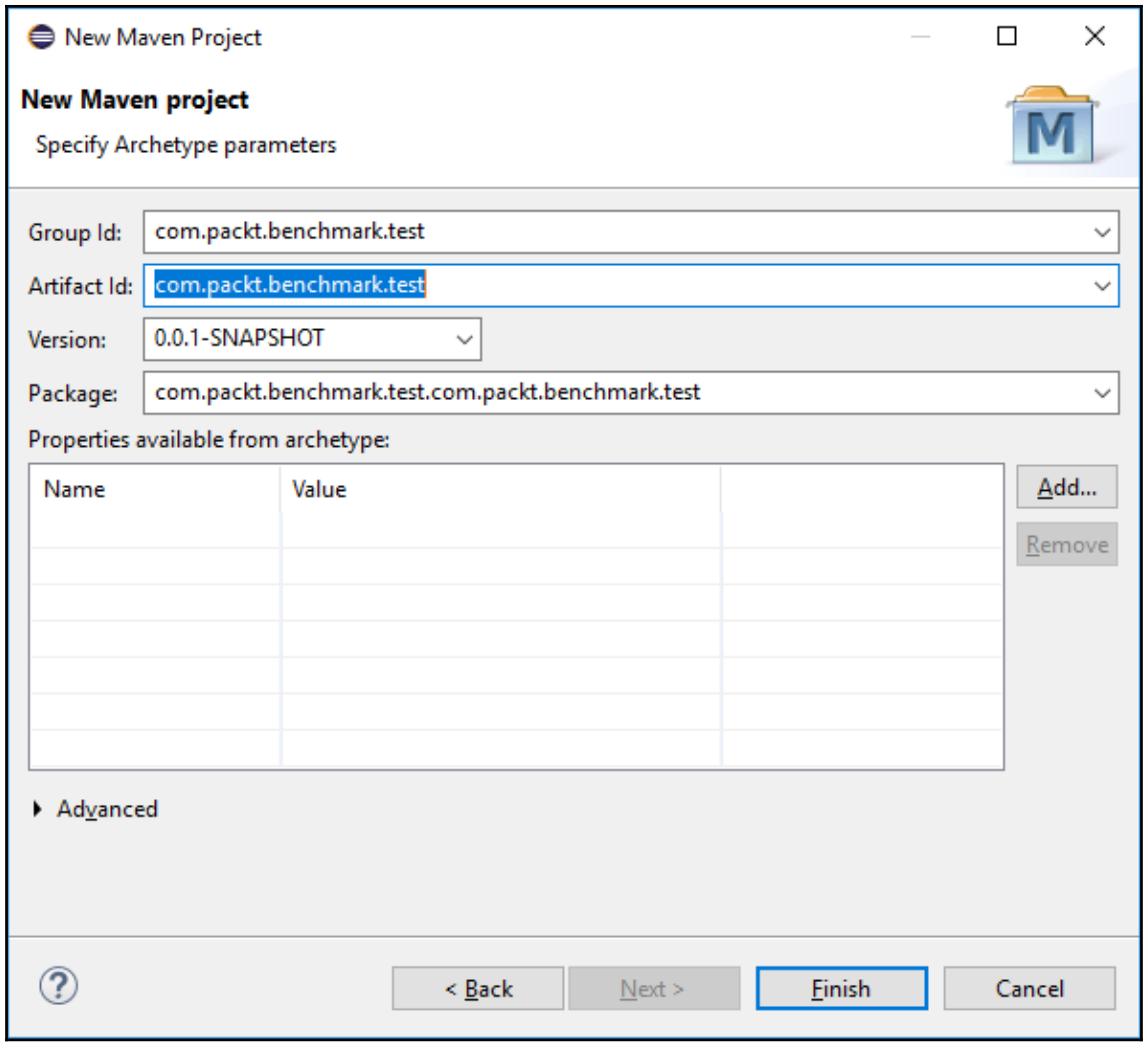
```
Garbage Collection Verification Test
------------------------------------------------------------
Initial JVM Memory: 514850816   Free Memory: 509439928
---------------------------------------
Free Memory before collection number 1: 768241776
Free Memory after collection number 1: 888052656
---------------------------------------
Free Memory before collection number 2: 888052656
Free Memory after collection number 2: 887536992
---------------------------------------
Free Memory before collection number 3: 887536992
Free Memory after collection number 3: 888061280
```

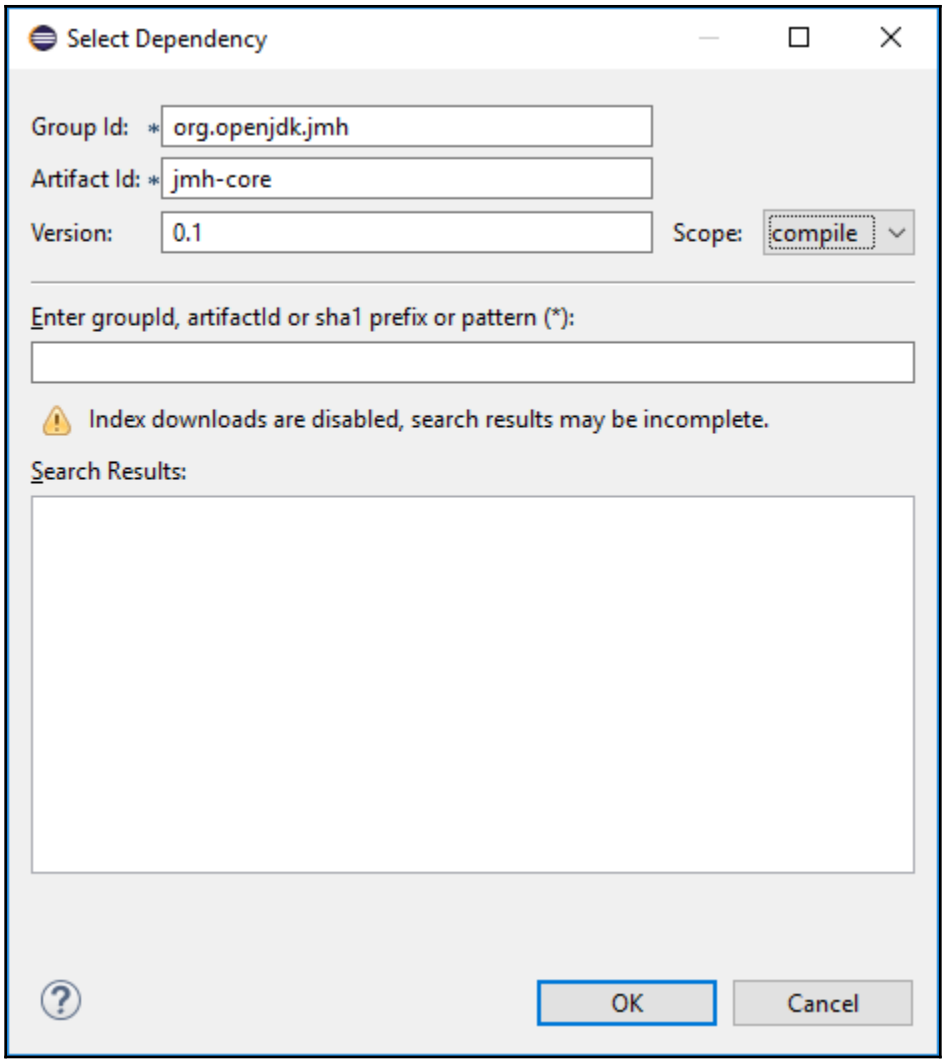
Line of Code	001	002	003	004	005	006	007
Code	String var = new String("G");	var+="a";	var+="r";	var+="b";	var+="a";	var+="g";	var+="e";
Referenced memory	var → "G"	var → "Ga"	var → "Gar"	var → "Garb"	var → "Garba"	var → "Garbag"	var → "Garbage"
Unreferenced memory		"G"	"G" "Ga"	"G" "Ga" "Gar"	"G" "Ga" "Gar" "Garb"	"G" "Ga" "Gar" "Garb" "Garba"	"G" "Ga" "Gar" "Garb" "Garbag"


Level of Verbosity
error
warning
info
debug
trace
Logging Level

Chapter 8: Microbenchmarking Applications with JMH




New Maven Project
New Maven project
Specify Archetype parameters
Group Id:
com.packt.benchmark.test
Artifact Id:
com.packt.benchmark.test
Version:
0.0.1-SNAPSHOT
Package:
com.packt.benchmark.test.com.packt.benchmark.test
Properties available from archetype:
Name
Value
Add...
Remove
Advanced
< Back
Next >
Finish
Cancel

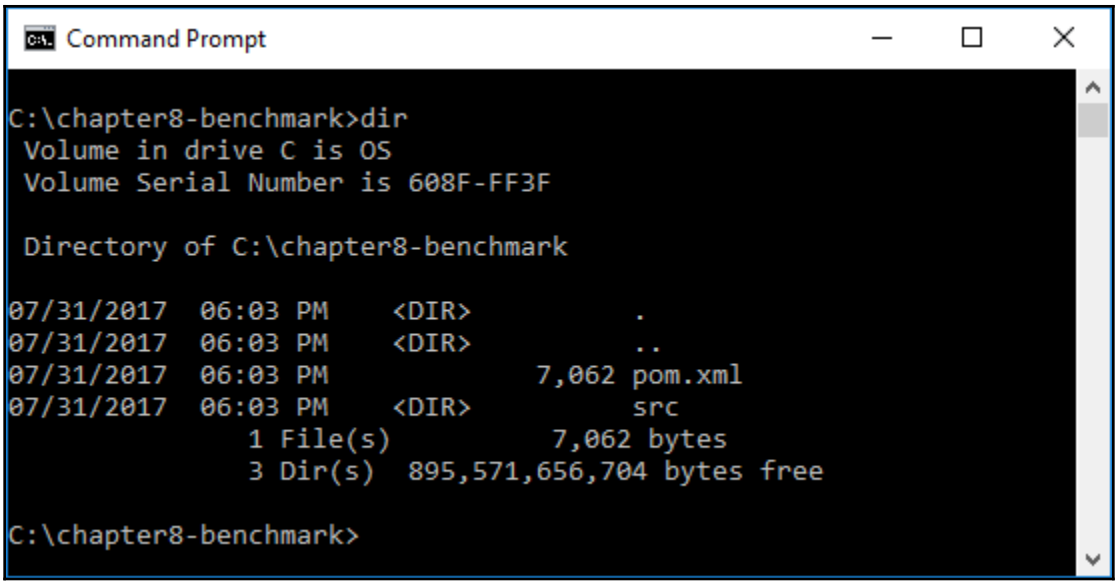


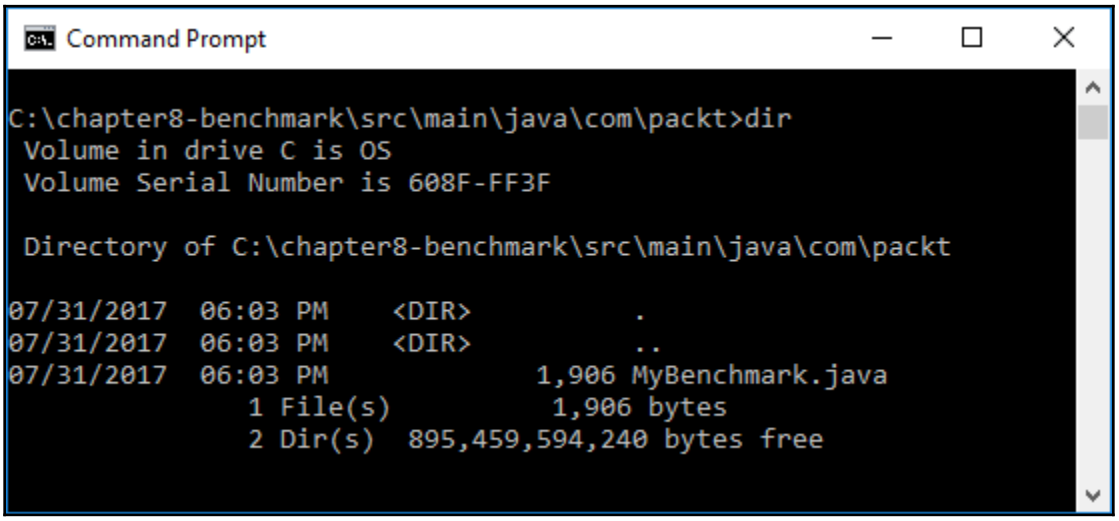

```
<terminated> Test [Java Application] C:\Program Files\Java\jre1.8.0_131\bin\javaw.exe (Jul 30, 2017, 8:04:30 PM)
No matching benchmarks. Miss-spelled regexp? Use -v for verbose output.
```

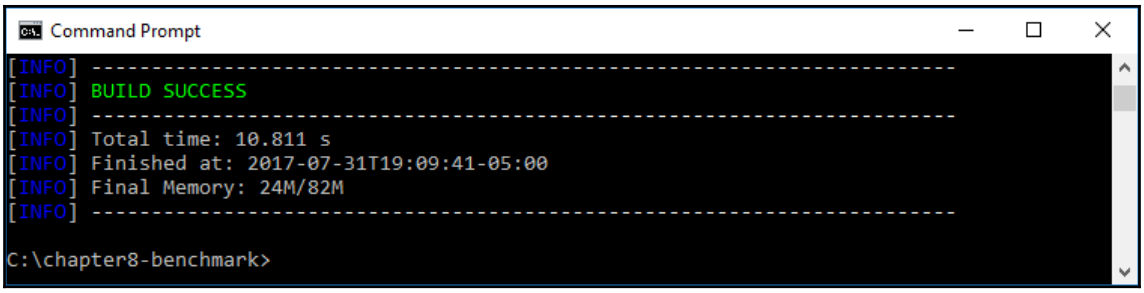
```
[INFO]
[INFO] ------------------------------------------------------------------------
[INFO] Building Maven Stub Project (No POM) 1
[INFO] ------------------------------------------------------------------------
[INFO]
[INFO] >>> maven-archetype-plugin:3.0.1:generate (default-cli) > generate-sources @ standalone-pom >>>
[INFO]
[INFO] <<< maven-archetype-plugin:3.0.1:generate (default-cli) < generate-sources @ standalone-pom <<<
[INFO]
[INFO]
[INFO] --- maven-archetype-plugin:3.0.1:generate (default-cli) @ standalone-pom ---
```

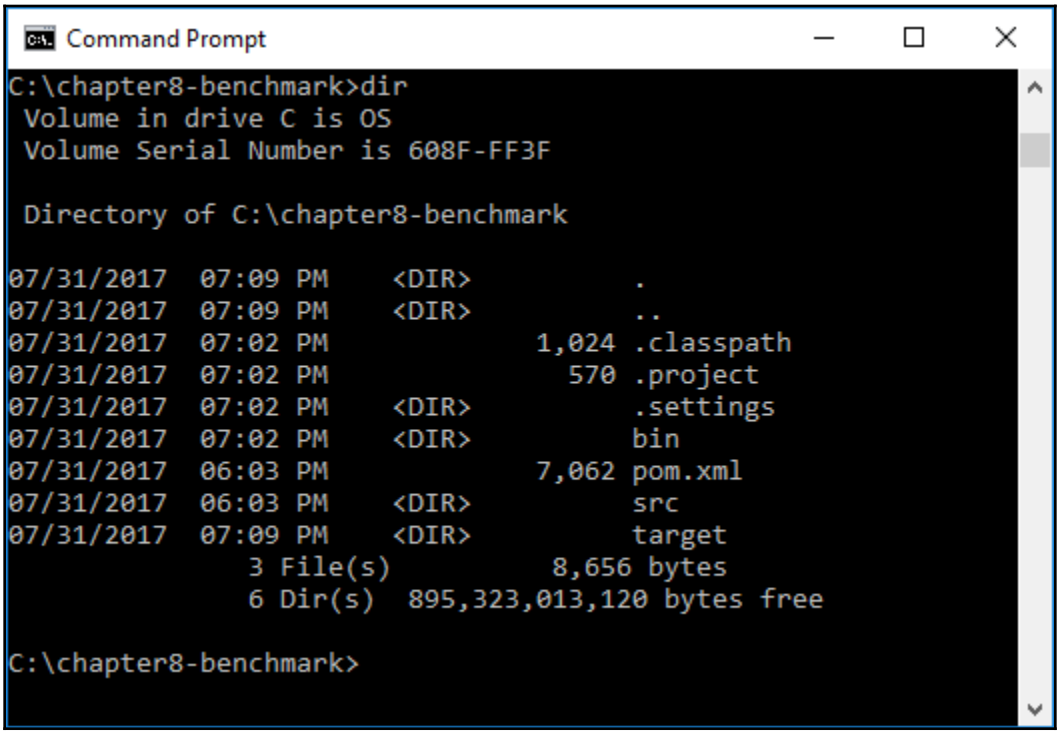
```
[INFO] Generating project in Batch mode
[INFO] Archetype [org.openjdk.jmh:jmh-java-benchmark-archetype:1.19] found in catalog remote
```

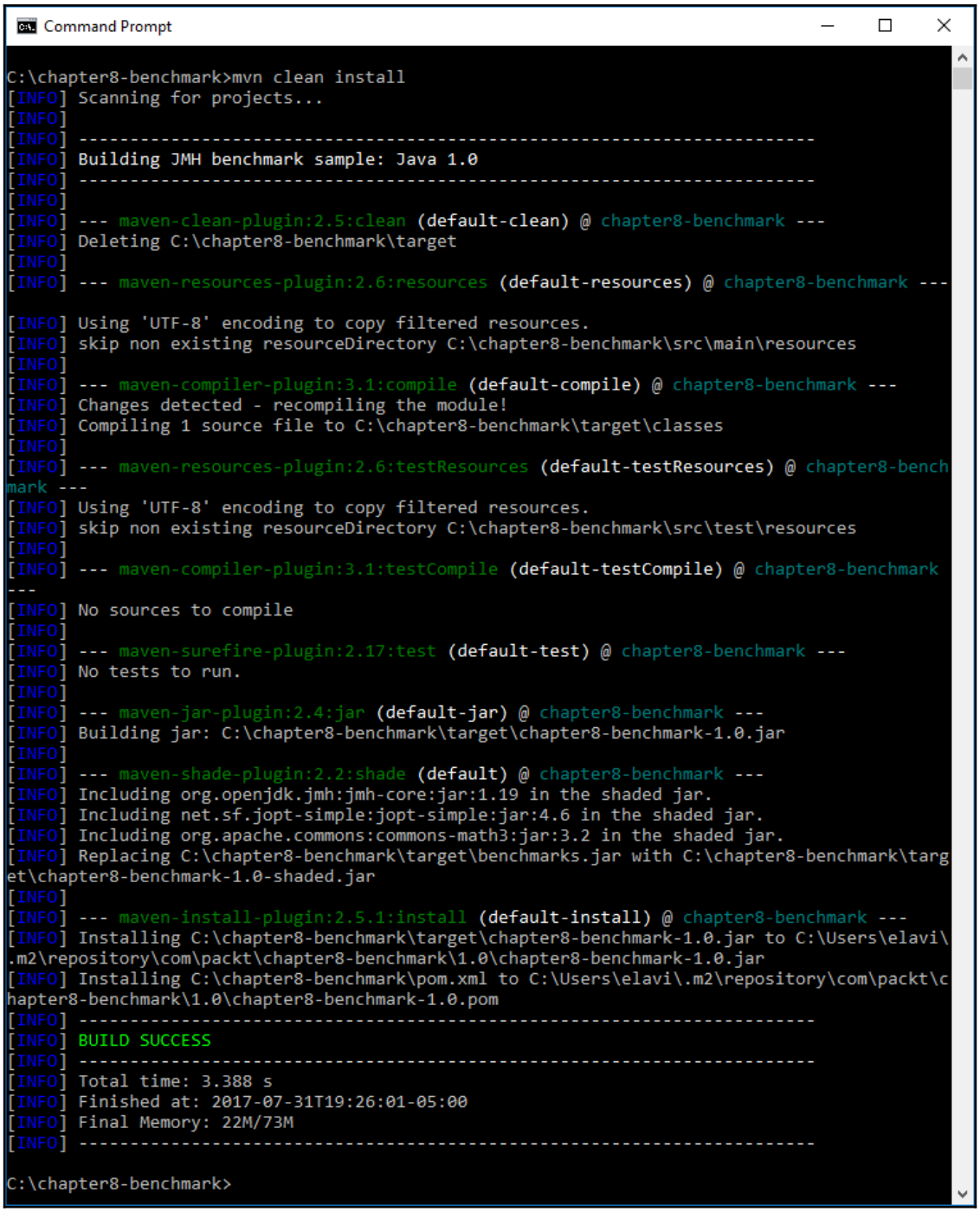
```
[INFO] ----------------------------------------------------------------------------
[INFO] Using following parameters for creating project from Archetype: jmh-java-benchmark-archetype:1.19
[INFO] ----------------------------------------------------------------------------
[INFO] Parameter: groupId, Value: com.packt
[INFO] Parameter: artifactId, Value: chapter8-benchmark
[INFO] Parameter: version, Value: 1.0
[INFO] Parameter: package, Value: com.packt
[INFO] Parameter: packageInPathFormat, Value: com/packt
[INFO] Parameter: package, Value: com.packt
[INFO] Parameter: groupId, Value: com.packt
[INFO] Parameter: artifactId, Value: chapter8-benchmark
[INFO] Parameter: version, Value: 1.0
[INFO] Project created from Archetype in dir: C:\chapter8-benchmark
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 20.753 s
[INFO] Finished at: 2017-07-31T18:03:27-05:00
[INFO] Final Memory: 18M/62M
[INFO] ------------------------------------------------------------------------

C:\>
```

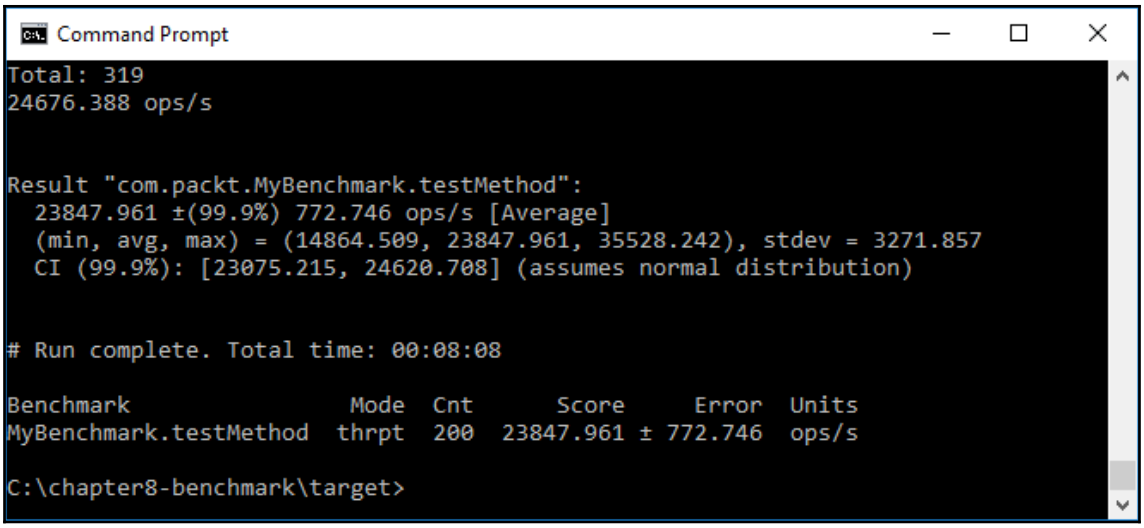

Command Prompt
C:\chapter8-benchmark>dir
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\chapter8-benchmark
07/31/2017 06:03 PM <DIR> .
07/31/2017 06:03 PM <DIR> ..
07/31/2017 06:03 PM 7,062 pom.xml
07/31/2017 06:03 PM <DIR> src
1 File(s) 7,062 bytes
3 Dir(s) 895,571,656,704 bytes free
C:\chapter8-benchmark>


Command Prompt
C:\chapter8-benchmark\src\main\java\com\packt>dir
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\chapter8-benchmark\src\main\java\com\packt
07/31/2017 06:03 PM <DIR> .
07/31/2017 06:03 PM <DIR> ..
07/31/2017 06:03 PM 1,906 MyBenchmark.java
1 File(s) 1,906 bytes
2 Dir(s) 895,459,594,240 bytes free

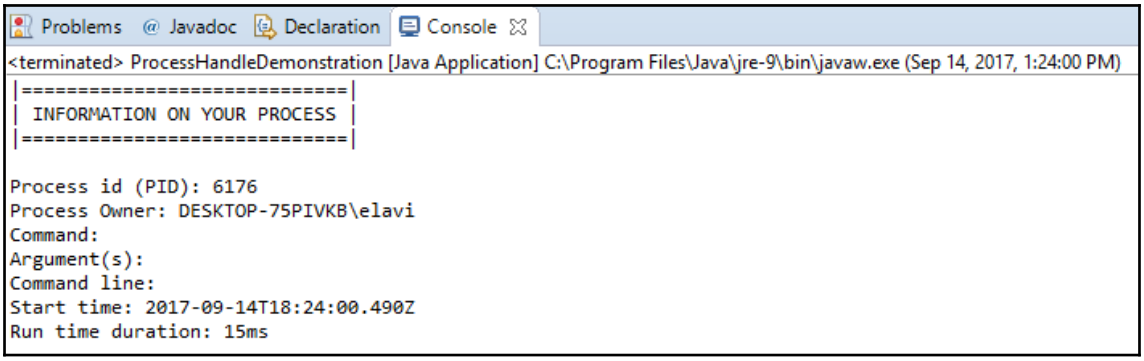

Command Prompt
[INFO] --
[INFO] BUILD SUCCESS
[INFO] --
[INFO] Total time: 10.811 s
[INFO] Finished at: 2017-07-31T19:09:41-05:00
[INFO] Final Memory: 24M/82M
[INFO] --
C:\chapter8-benchmark>

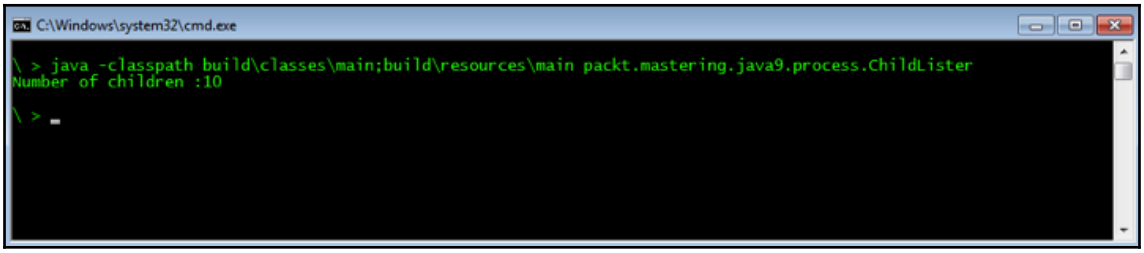

Command Prompt
C:\chapter8-benchmark>dir
Volume in drive C is OS
Volume Serial Number is 608F-FF3F
Directory of C:\chapter8-benchmark
07/31/2017 07:09 PM <DIR> .
07/31/2017 07:09 PM <DIR> ..
07/31/2017 07:02 PM 1,024 .classpath
07/31/2017 07:02 PM 570 .project
07/31/2017 07:02 PM <DIR> .settings
07/31/2017 07:02 PM <DIR> bin
07/31/2017 06:03 PM 7,062 pom.xml
07/31/2017 06:03 PM <DIR> src
07/31/2017 07:09 PM <DIR> target
3 File(s) 8,656 bytes
6 Dir(s) 895,323,013,120 bytes free
C:\chapter8-benchmark>

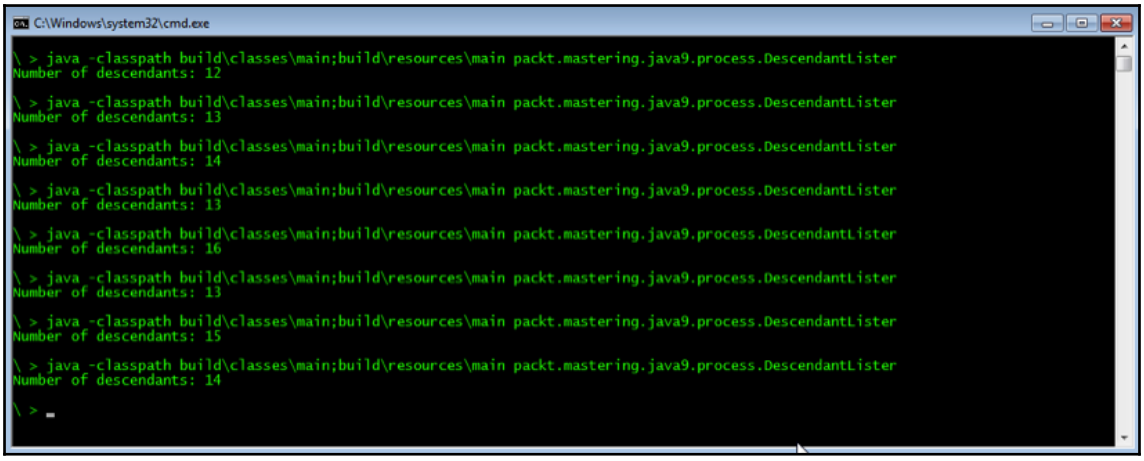

Command Prompt
C:\chapter8-benchmark>mvn clean install
[INFO] Scanning for projects...
[INFO]
[INFO] --
[INFO] Building JMH benchmark sample: Java 1.0
[INFO] --
[INFO]
[INFO] --- maven-clean-plugin:2.5:clean (default-clean) @ chapter8-benchmark ---
[INFO] Deleting C:\chapter8-benchmark\target
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ chapter8-benchmark ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory C:\chapter8-benchmark\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ chapter8-benchmark ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to C:\chapter8-benchmark\target\classes
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ chapter8-benchmark ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory C:\chapter8-benchmark\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ chapter8-benchmark ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-surefire-plugin:2.17:test (default-test) @ chapter8-benchmark ---
[INFO] No tests to run.
[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ chapter8-benchmark ---
[INFO] Building jar: C:\chapter8-benchmark\target\chapter8-benchmark-1.0.jar
[INFO]
[INFO] --- maven-shade-plugin:2.2:shade (default) @ chapter8-benchmark ---
[INFO] Including org.openjdk.jmh:jmh-core:jar:1.19 in the shaded jar.
[INFO] Including net.sf.jopt-simple:jopt-simple:jar:4.6 in the shaded jar.
[INFO] Including org.apache.commons:commons-math3:jar:3.2 in the shaded jar.
[INFO] Replacing C:\chapter8-benchmark\target\benchmarks.jar with C:\chapter8-benchmark\target\chapter8-benchmark-1.0-shaded.jar
[INFO]
[INFO] --- maven-install-plugin:2.5.1:install (default-install) @ chapter8-benchmark ---
[INFO] Installing C:\chapter8-benchmark\target\chapter8-benchmark-1.0.jar to C:\Users\elavi\.m2\repository\com\packt\chapter8-benchmark\1.0\chapter8-benchmark-1.0.jar
[INFO] Installing C:\chapter8-benchmark\pom.xml to C:\Users\elavi\.m2\repository\com\packt\chapter8-benchmark\1.0\chapter8-benchmark-1.0.pom
[INFO] --
[INFO] BUILD SUCCESS
[INFO] --
[INFO] Total time: 3.388 s
[INFO] Finished at: 2017-07-31T19:26:01-05:00
[INFO] Final Memory: 22M/73M
[INFO] --
C:\chapter8-benchmark>

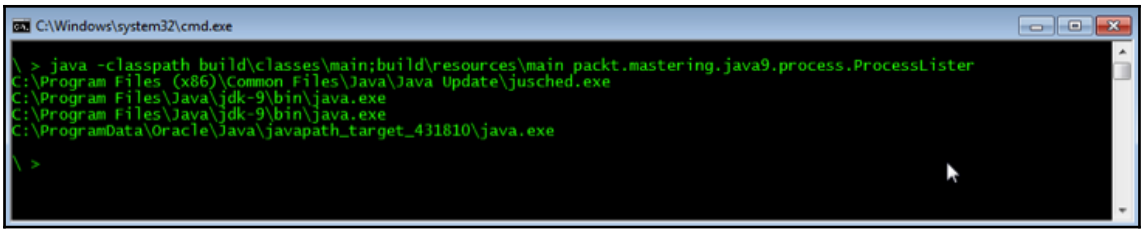

Command Prompt
Total: 319
24676.388 ops/s
Result "com.packt.MyBenchmark.testMethod":
23847.961 ±(99.9%) 772.746 ops/s [Average]
(min, avg, max) = (14864.509, 23847.961, 35528.242), stdev = 3271.857
CI (99.9%): [23075.215, 24620.708] (assumes normal distribution)
Run complete. Total time: 00:08:08
Benchmark Mode Cnt Score Error Units
MyBenchmark.testMethod thrpt 200 23847.961 ± 772.746 ops/s
C:\chapter8-benchmark\target>

Chapter 9: Making Use of the Process API

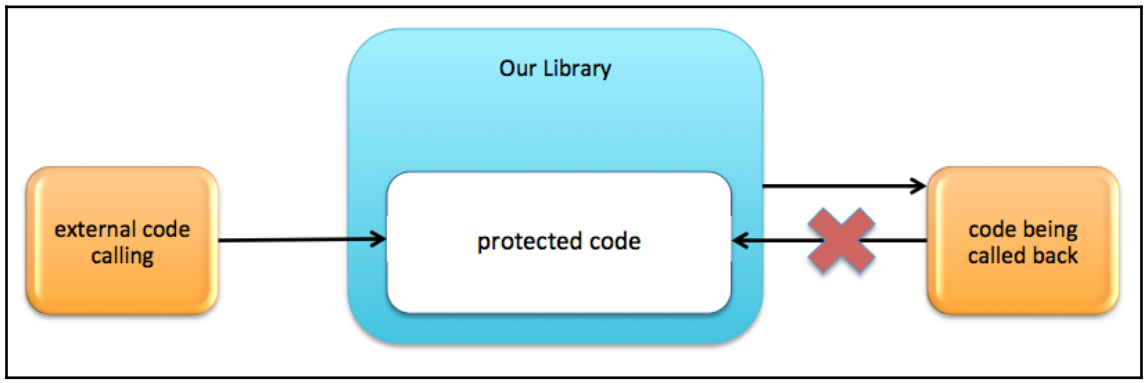


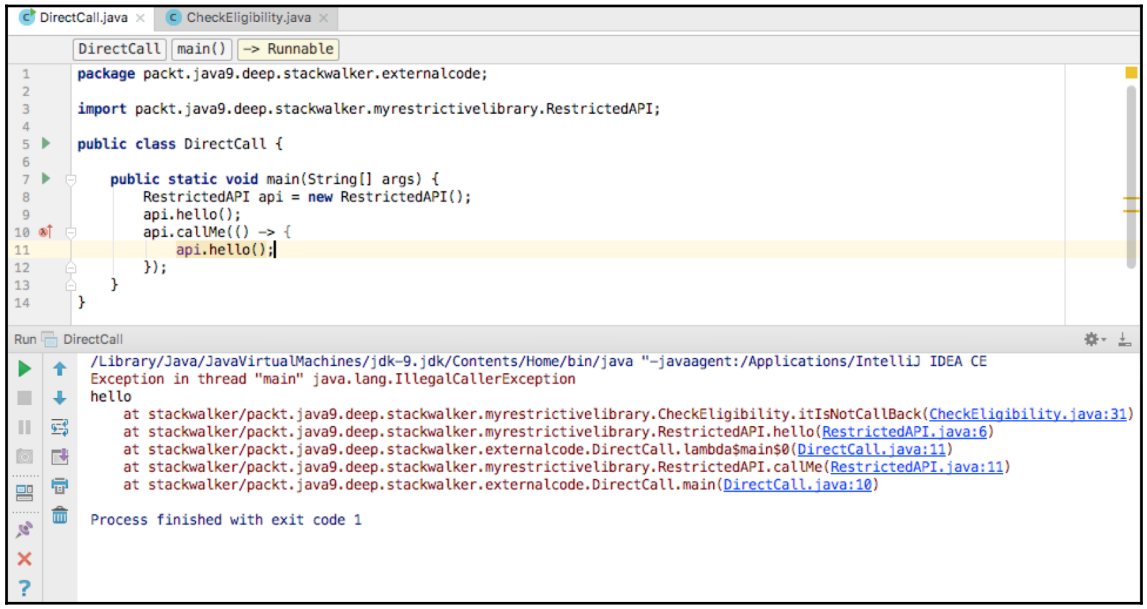




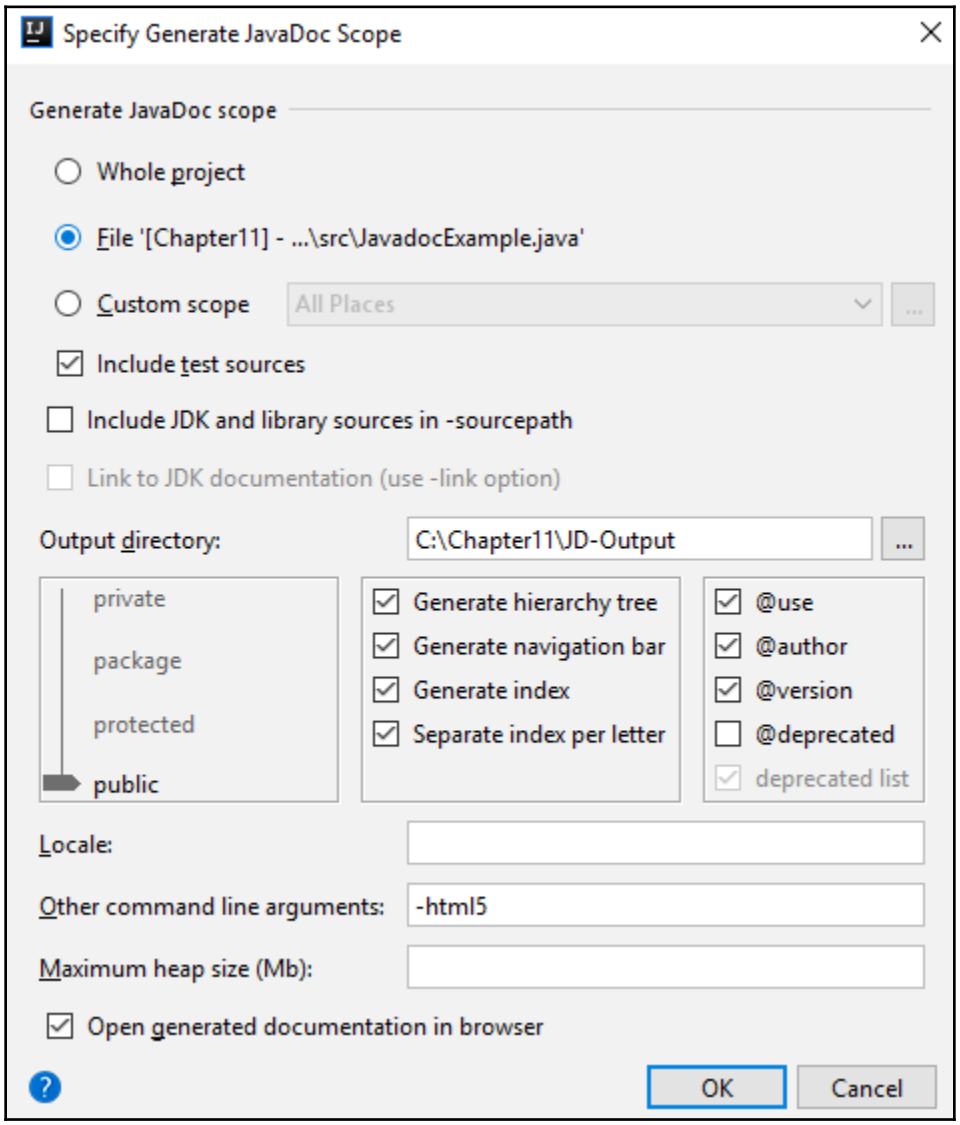

C:\Windows\system32\cmd.exe
\ > java -classpath build\classes\main;build\resources\main packt.mastering.java9.process.ProcessLister
C:\Program Files (x86)\Common Files\Java\Java Update\jusched.exe
C:\Program Files\Java\jdk-9\bin\java.exe
C:\Program Files\Java\jdk-9\bin\java.exe
C:\ProgramData\Oracle\Java\javapath_target_431810\java.exe
\ >

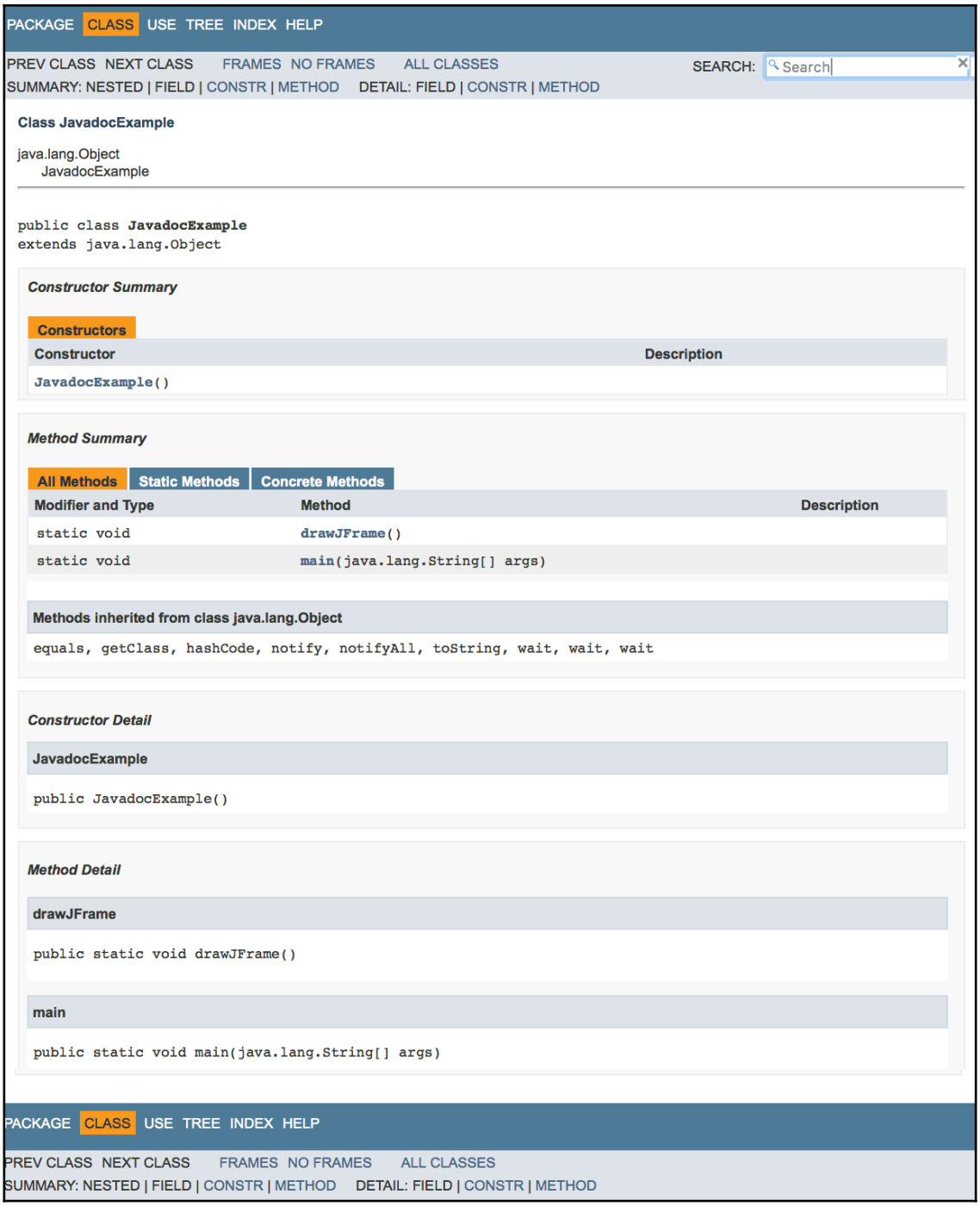
Chapter 10: Fine-Grained Stack Tracing





Chapter 11: New Tools and Tool Enhancements





PACKAGE CLASS USE TREE INDEX HELP

PREV CLASS NEXT CLASS FRAMES NO FRAMES ALL CLASSES SEARCH: Search

SUMMARY: NESTED | FIELD | CONSTR | METHOD DETAIL: FIELD | CONSTR | METHOD

Class JavadocExample

java.lang.Object
JavadocExample

```
public class JavadocExample
extends java.lang.Object
```

Constructor Summary

Constructors

Constructor	Description
`JavadocExample()`	

Method Summary

All Methods **Static Methods** **Concrete Methods**

Modifier and Type	Method	Description
static void	`drawJFrame()`	
static void	`main(java.lang.String[] args)`	

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

JavadocExample

```
public JavadocExample()
```

Method Detail

drawJFrame

```
public static void drawJFrame()
```

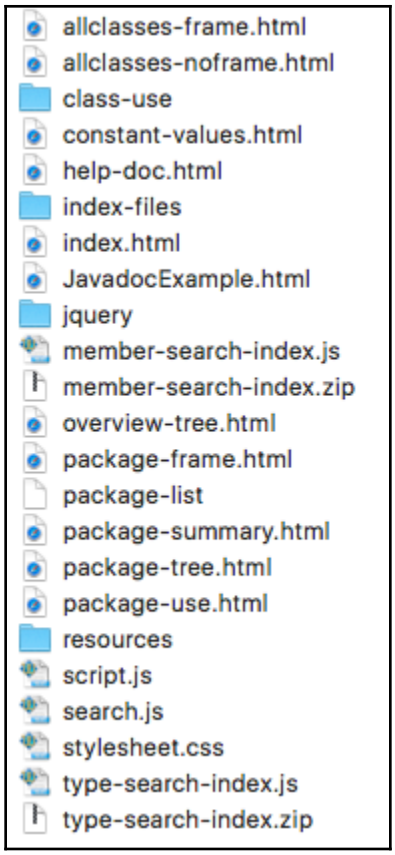
main

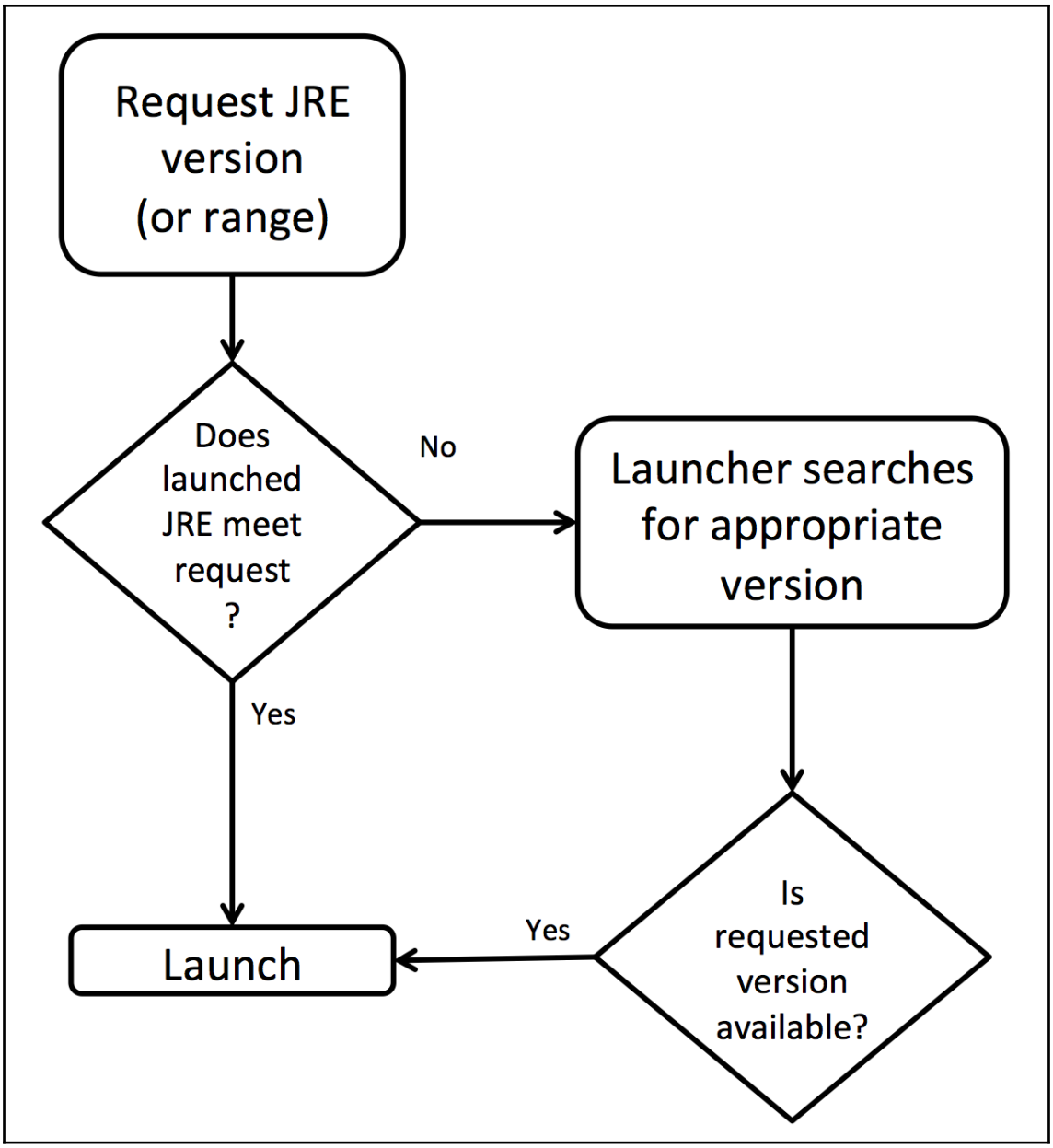
```
public static void main(java.lang.String[] args)
```

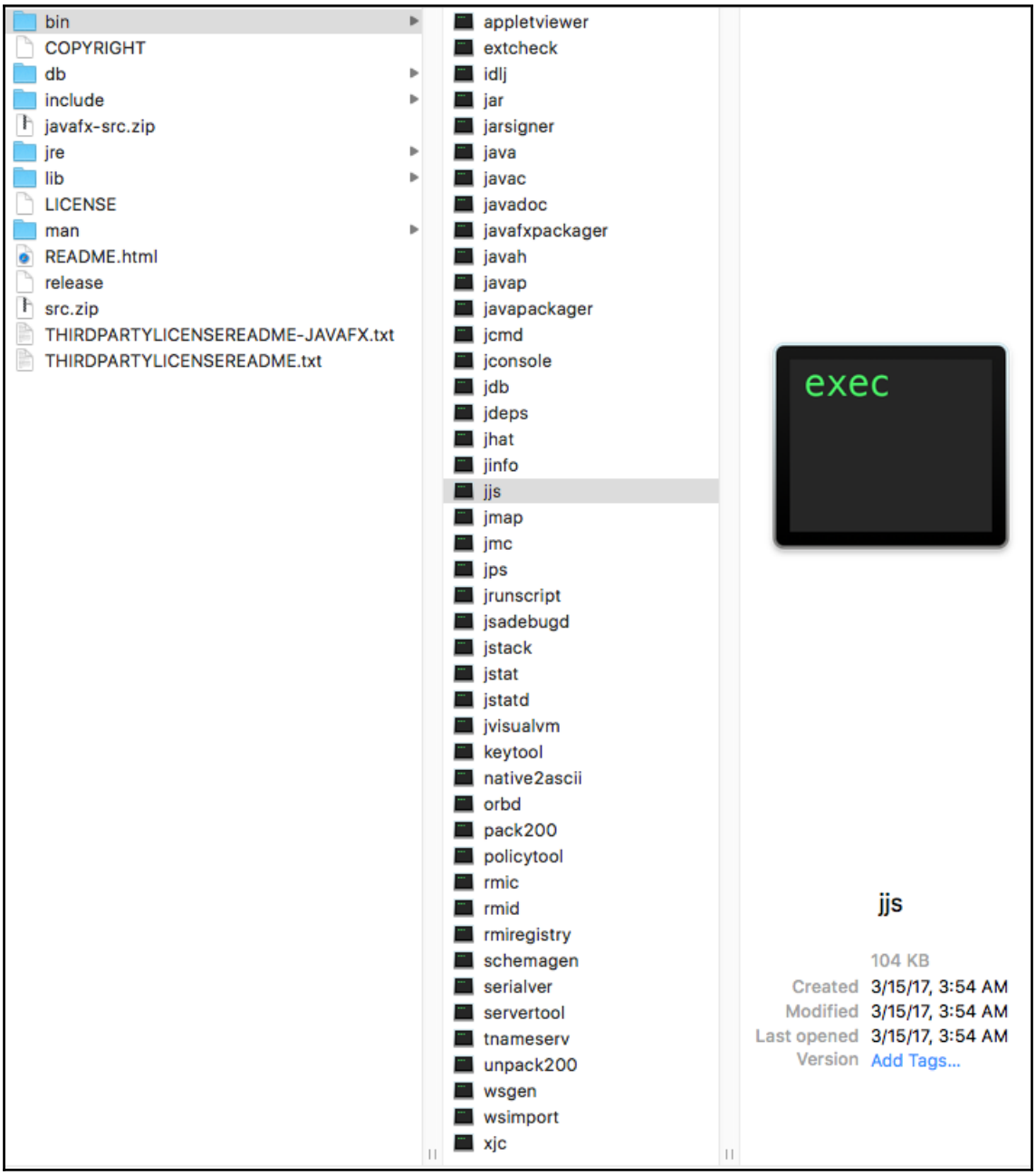
PACKAGE CLASS USE TREE INDEX HELP

PREV CLASS NEXT CLASS FRAMES NO FRAMES ALL CLASSES

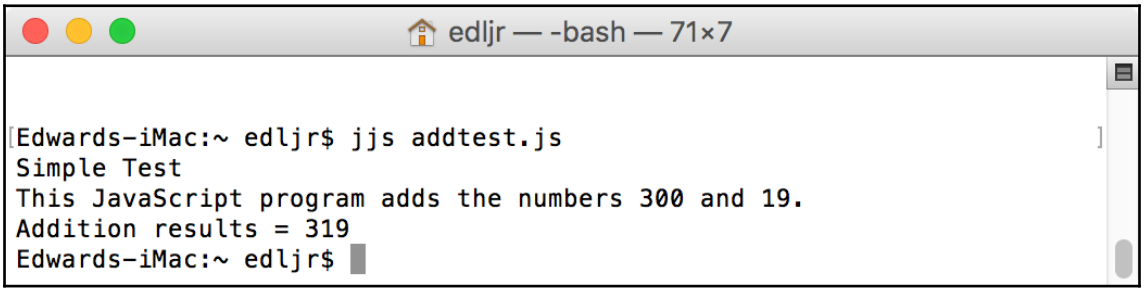
SUMMARY: NESTED | FIELD | CONSTR | METHOD DETAIL: FIELD | CONSTR | METHOD

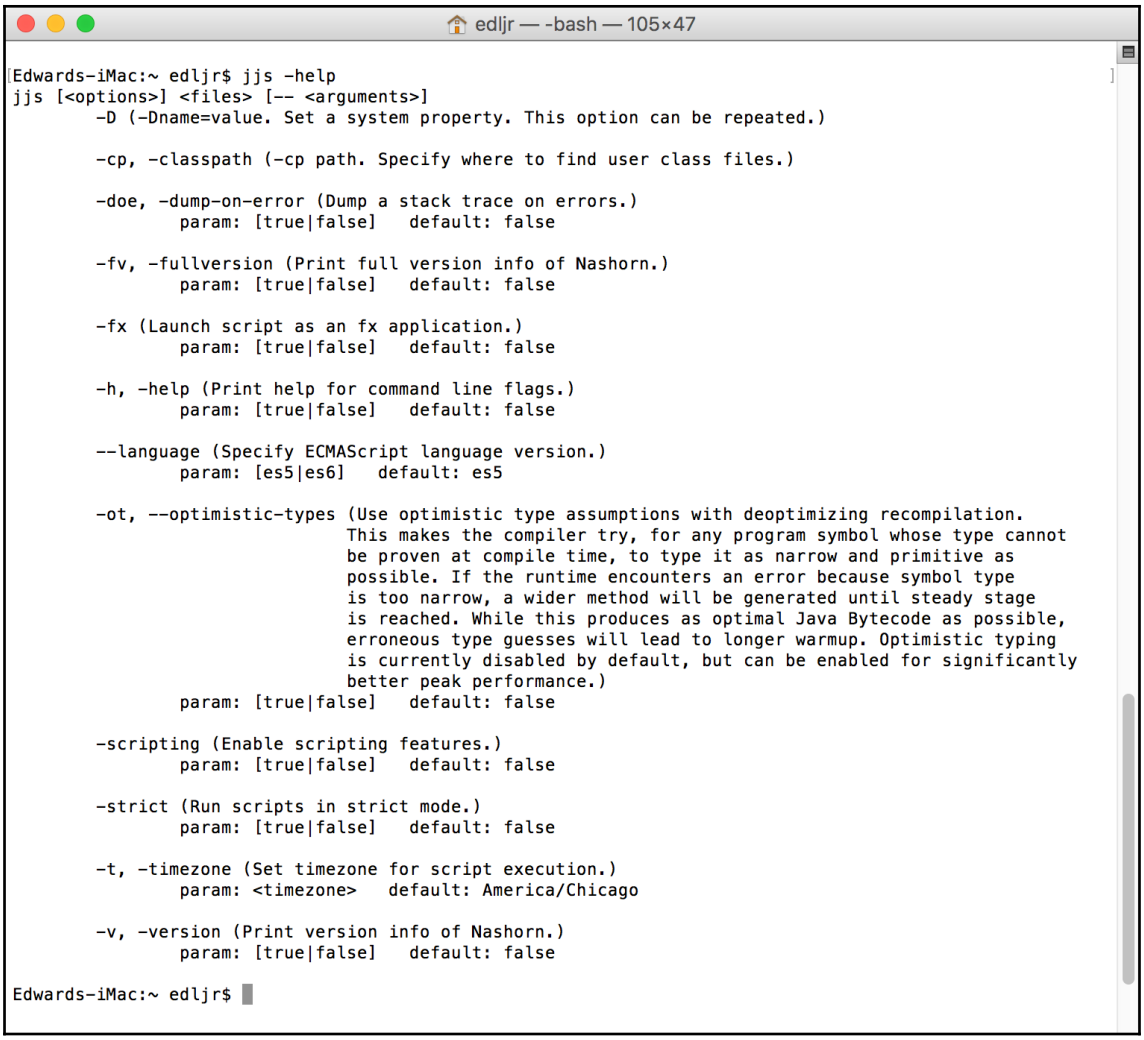

allclasses-frame.html
allclasses-noframe.html
class-use
constant-values.html
help-doc.html
index-files
index.html
JavadocExample.html
jquery
member-search-index.js
member-search-index.zip
overview-tree.html
package-frame.html
package-list
package-summary.html
package-tree.html
package-use.html
resources
script.js
search.js
stylesheet.css
type-search-index.js
type-search-index.zip

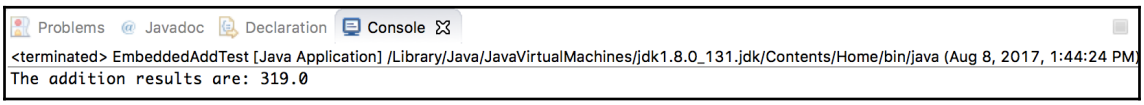

Request JRE version (or range)
Does launched JRE meet request ?
No
Launcher searches for appropriate version
Yes
Is requested version available?
Yes
Launch


bin
COPYRIGHT
db
include
javafx-src.zip
jre
lib
LICENSE
man
README.html
release
src.zip
THIRDPARTYLICENSEREADME-JAVAFX.txt
THIRDPARTYLICENSEREADME.txt
appletviewer
extcheck
idlj
jar
jarsigner
java
javac
javadoc
javafxpackager
javah
javap
javapackager
jcmd
jconsole
jdb
jdeps
jhat
jinfo
jjs
jmap
jmc
jps
jrunscript
jsadebugd
jstack
jstat
jstatd
jvisualvm
keytool
native2ascii
orbd
pack200
policytool
rmic
rmid
rmiregistry
schemagen
serialver
servertool
tnameserv
unpack200
wsgen
wsimport
xjc
exec
jjs
104 KB
Created 3/15/17, 3:54 AM
Modified 3/15/17, 3:54 AM
Last opened 3/15/17, 3:54 AM
Version Add Tags...


edljr — jjs -version — 76×10
Edwards-iMac:~ edljr$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
Edwards-iMac:~ edljr$ jjs -version
nashorn 1.8.0_121
jjs>


edljr — -bash — 71×7
Edwards-iMac:~ edljr$ jjs addtest.js
Simple Test
This JavaScript program adds the numbers 300 and 19.
Addition results = 319
Edwards-iMac:~ edljr$


edljr — -bash — 105×47
Edwards-iMac:~ edljr$ jjs -help
jjs [<options>] <files> [-- <arguments>]
-D (-Dname=value. Set a system property. This option can be repeated.)
-cp, -classpath (-cp path. Specify where to find user class files.)
-doe, -dump-on-error (Dump a stack trace on errors.)
param: [true|false] default: false
-fv, -fullversion (Print full version info of Nashorn.)
param: [true|false] default: false
-fx (Launch script as an fx application.)
param: [true|false] default: false
-h, -help (Print help for command line flags.)
param: [true|false] default: false
--language (Specify ECMAScript language version.)
param: [es5|es6] default: es5
-ot, --optimistic-types (Use optimistic type assumptions with deoptimizing recompilation.
This makes the compiler try, for any program symbol whose type cannot
be proven at compile time, to type it as narrow and primitive as
possible. If the runtime encounters an error because symbol type
is too narrow, a wider method will be generated until steady stage
is reached. While this produces as optimal Java Bytecode as possible,
erroneous type guesses will lead to longer warmup. Optimistic typing
is currently disabled by default, but can be enabled for significantly
better peak performance.)
param: [true|false] default: false
-scripting (Enable scripting features.)
param: [true|false] default: false
-strict (Run scripts in strict mode.)
param: [true|false] default: false
-t, -timezone (Set timezone for script execution.)
param: <timezone> default: America/Chicago
-v, -version (Print version info of Nashorn.)
param: [true|false] default: false
Edwards-iMac:~ edljr$


Problems
Javadoc
Declaration
Console
<terminated> EmbeddedAddTest [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_131.jdk/Contents/Home/bin/java (Aug 8, 2017, 1:44:24 PM)
The addition results are: 319.0

Class Hierarchy

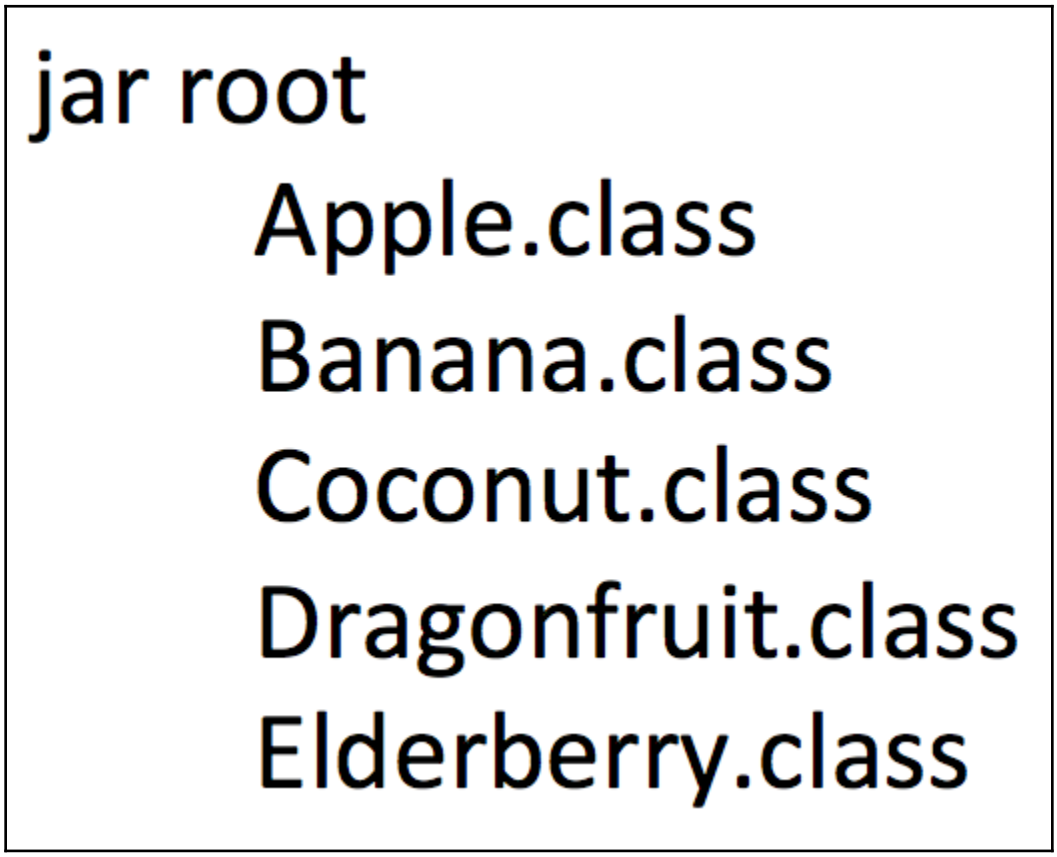
- java.lang.**Object**
  - jdk.nashorn.api.tree.**SimpleTreeVisitorES5_1**<R,P> (implements jdk.nashorn.api.tree.TreeVisitor<R,P>)
    - jdk.nashorn.api.tree.**SimpleTreeVisitorES6**<R,P>
  - java.lang.**Throwable** (implements java.io.Serializable)
    - java.lang.**Exception**
      - java.lang.**RuntimeException**
        - jdk.nashorn.api.tree.**UnknownTreeException**

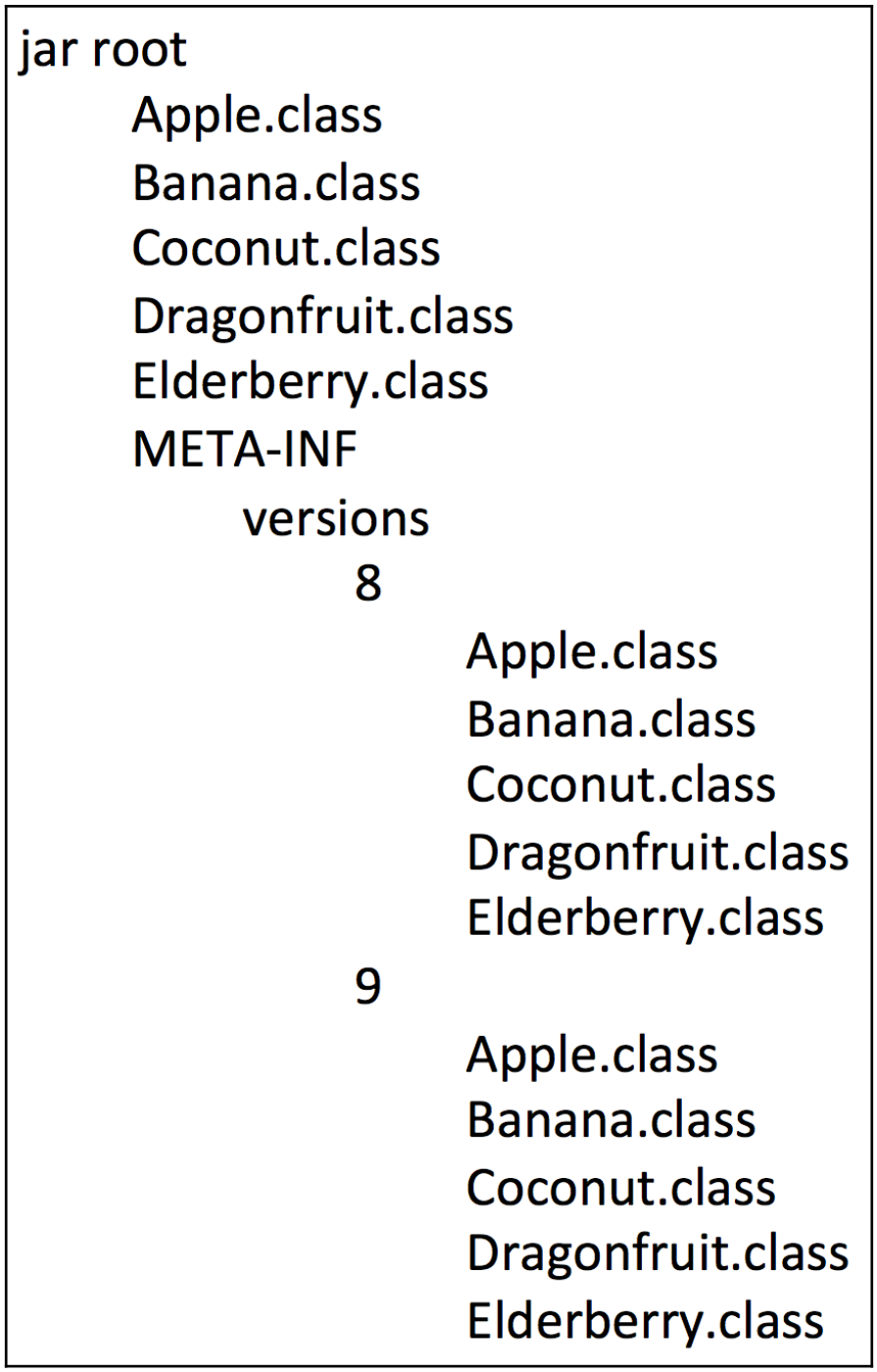
Interface Hierarchy

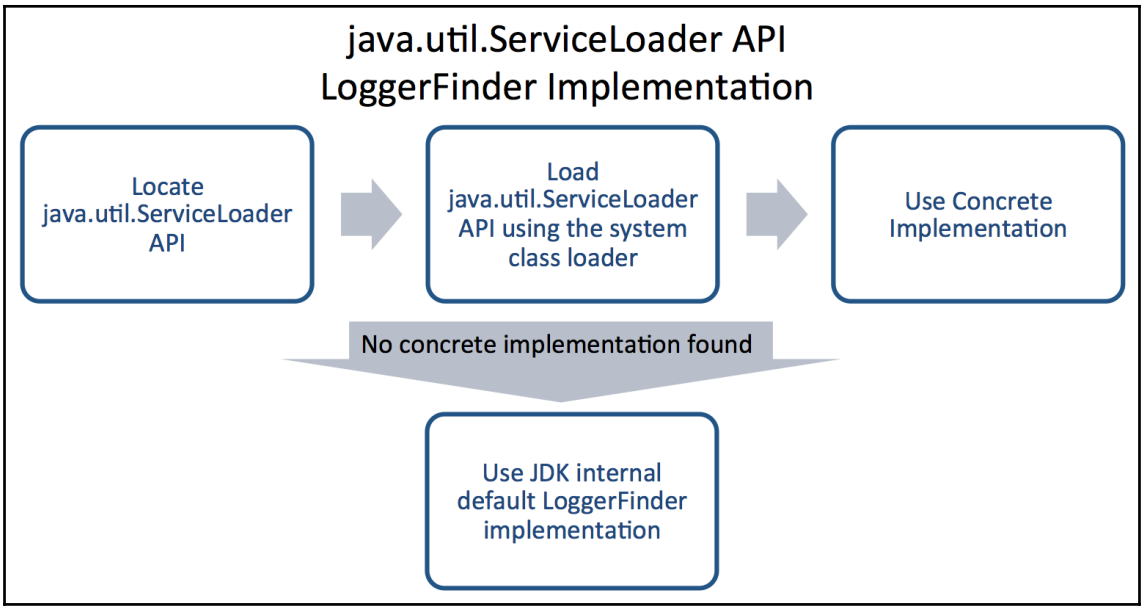
- jdk.nashorn.api.tree.**Diagnostic**
- jdk.nashorn.api.tree.**DiagnosticListener**
- jdk.nashorn.api.tree.**LineMap**
- jdk.nashorn.api.tree.**Parser**
- jdk.nashorn.api.tree.**Tree**
  - jdk.nashorn.api.tree.**CaseTree**
  - jdk.nashorn.api.tree.**CatchTree**
  - jdk.nashorn.api.tree.**CompilationUnitTree**
  - jdk.nashorn.api.tree.**ExportEntryTree**
  - jdk.nashorn.api.tree.**ExpressionTree**
    - jdk.nashorn.api.tree.**ArrayAccessTree**
    - jdk.nashorn.api.tree.**ArrayLiteralTree**
    - jdk.nashorn.api.tree.**AssignmentTree**
    - jdk.nashorn.api.tree.**BinaryTree**
    - jdk.nashorn.api.tree.**ClassExpressionTree**
    - jdk.nashorn.api.tree.**CompoundAssignmentTree**
    - jdk.nashorn.api.tree.**ConditionalExpressionTree**
    - jdk.nashorn.api.tree.**ErroneousTree**
    - jdk.nashorn.api.tree.**FunctionCallTree**
    - jdk.nashorn.api.tree.**FunctionExpressionTree**
    - jdk.nashorn.api.tree.**IdentifierTree**
    - jdk.nashorn.api.tree.**InstanceOfTree**
    - jdk.nashorn.api.tree.**LiteralTree**
    - jdk.nashorn.api.tree.**MemberSelectTree**
    - jdk.nashorn.api.tree.**NewTree**
    - jdk.nashorn.api.tree.**ObjectLiteralTree**
    - jdk.nashorn.api.tree.**ParenthesizedTree**
    - jdk.nashorn.api.tree.**RegExpLiteralTree**
    - jdk.nashorn.api.tree.**SpreadTree**
    - jdk.nashorn.api.tree.**TemplateLiteralTree**
    - jdk.nashorn.api.tree.**UnaryTree**
    - jdk.nashorn.api.tree.**YieldTree**
  - jdk.nashorn.api.tree.**ImportEntryTree**
  - jdk.nashorn.api.tree.**ModuleTree**
  - jdk.nashorn.api.tree.**PropertyTree**
  - jdk.nashorn.api.tree.**StatementTree**
    - jdk.nashorn.api.tree.**BlockTree**
    - jdk.nashorn.api.tree.**ClassDeclarationTree**
    - jdk.nashorn.api.tree.**DebuggerTree**
    - jdk.nashorn.api.tree.**EmptyStatementTree**
    - jdk.nashorn.api.tree.**ExpressionStatementTree**
    - jdk.nashorn.api.tree.**FunctionDeclarationTree**
    - jdk.nashorn.api.tree.**GotoTree**
      - jdk.nashorn.api.tree.**BreakTree**
      - jdk.nashorn.api.tree.**ContinueTree**
    - jdk.nashorn.api.tree.**IfTree**
    - jdk.nashorn.api.tree.**LabeledStatementTree**
    - jdk.nashorn.api.tree.**LoopTree**
      - jdk.nashorn.api.tree.**ConditionalLoopTree**
        - jdk.nashorn.api.tree.**DoWhileLoopTree**
        - jdk.nashorn.api.tree.**ForLoopTree**
        - jdk.nashorn.api.tree.**WhileLoopTree**
      - jdk.nashorn.api.tree.**ForInLoopTree**
      - jdk.nashorn.api.tree.**ForOfLoopTree**
    - jdk.nashorn.api.tree.**ReturnTree**
    - jdk.nashorn.api.tree.**SwitchTree**
    - jdk.nashorn.api.tree.**ThrowTree**
    - jdk.nashorn.api.tree.**TryTree**
    - jdk.nashorn.api.tree.**VariableTree**
    - jdk.nashorn.api.tree.**WithTree**
- jdk.nashorn.api.tree.**TreeVisitor**<R,P>

Enum Hierarchy

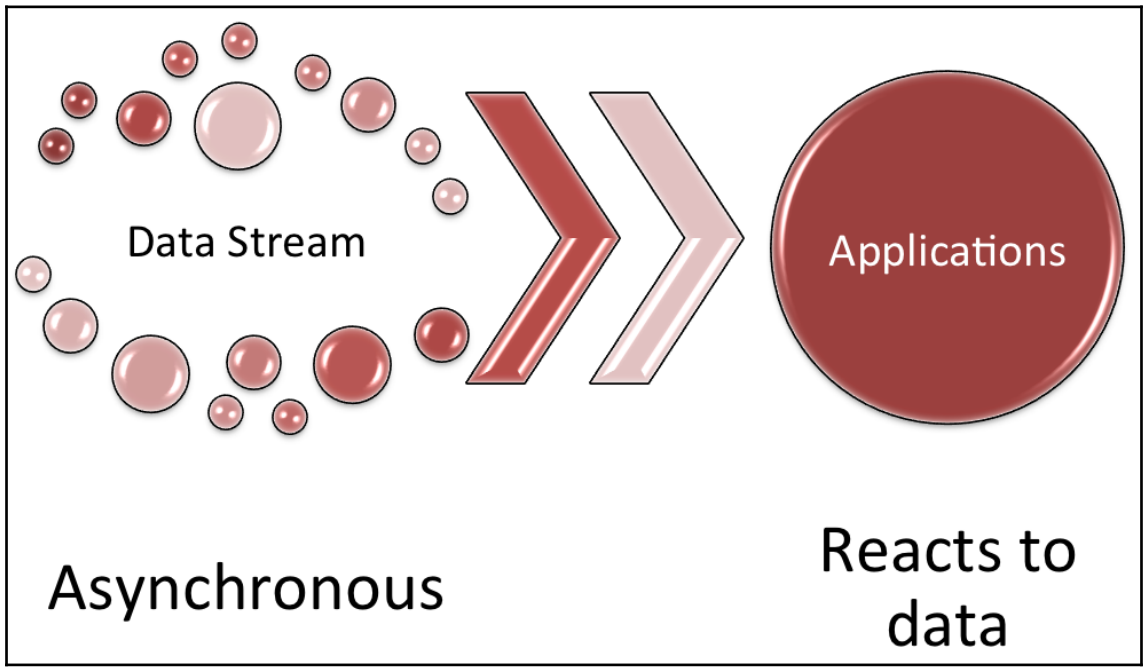
- java.lang.**Object**
  - java.lang.**Enum**<E> (implements java.lang.Comparable<T>, java.io.Serializable)
    - jdk.nashorn.api.tree.**Diagnostic.Kind**
    - jdk.nashorn.api.tree.**Tree.Kind**

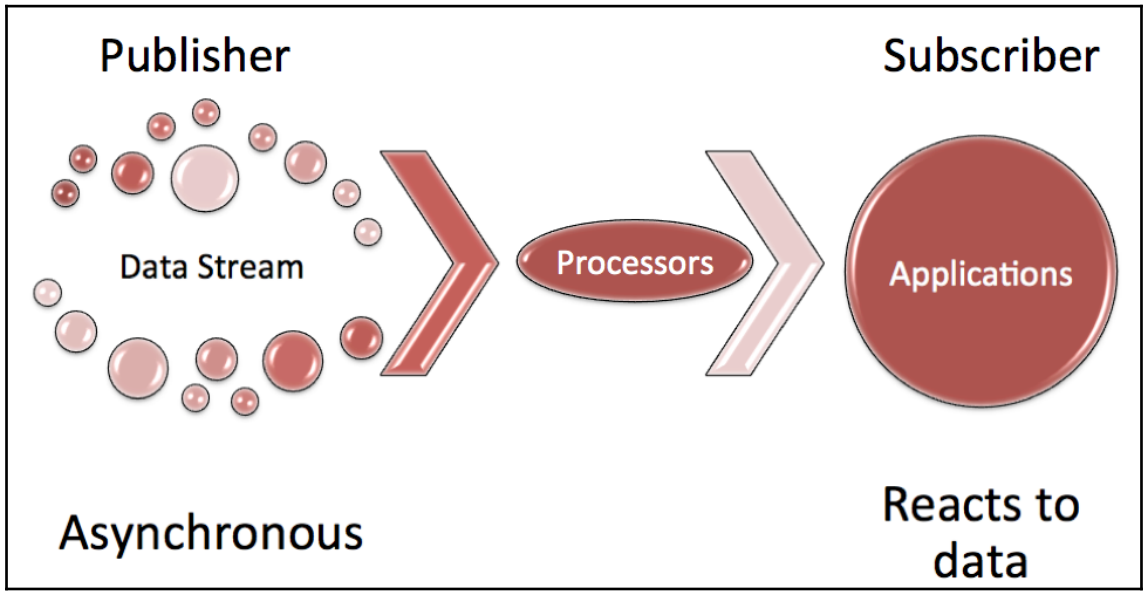


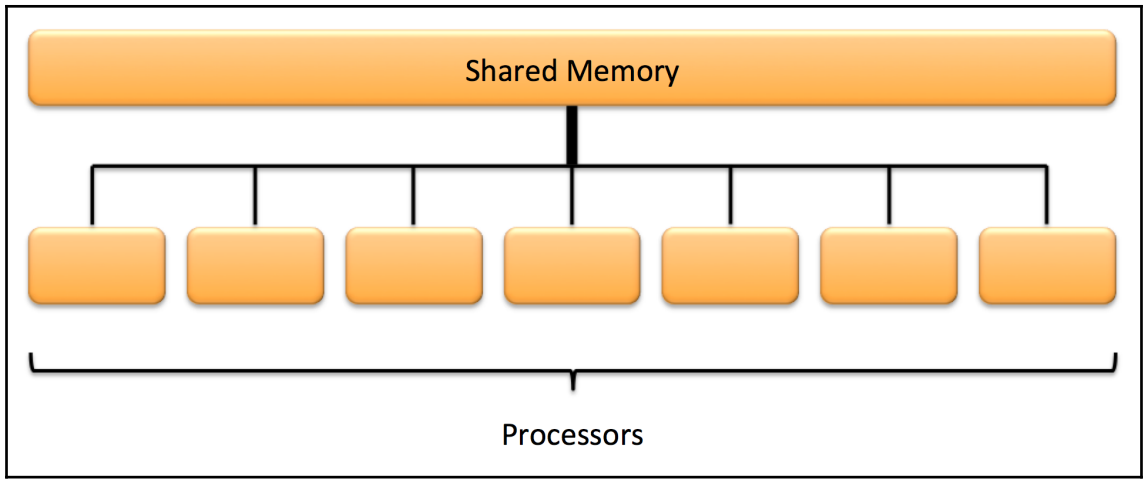

jar root
Apple.class
Banana.class
Coconut.class
Dragonfruit.class
Elderberry.class
META-INF
versions
8
Apple.class
Banana.class
Coconut.class
Dragonfruit.class
Elderberry.class
9
Apple.class
Banana.class
Coconut.class
Dragonfruit.class
Elderberry.class

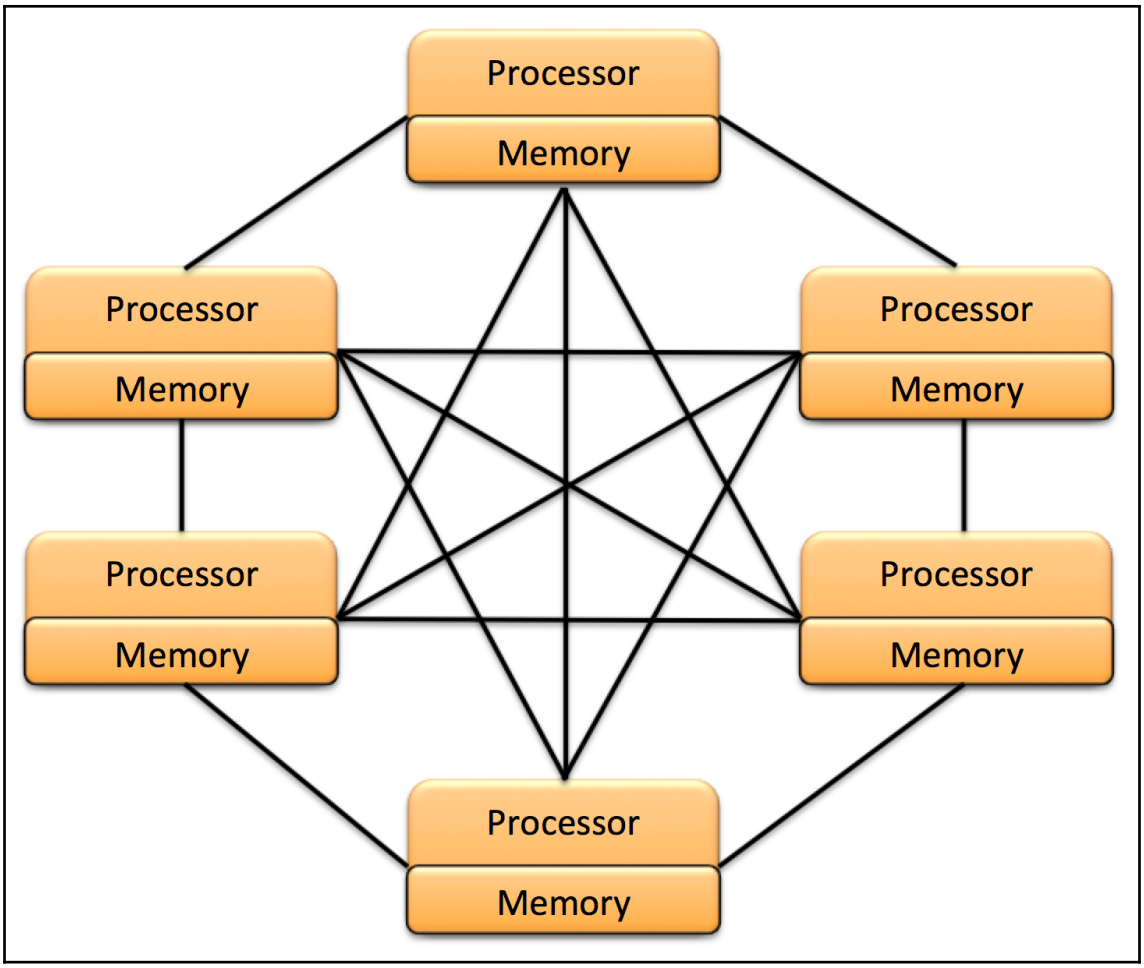



```
Problems  Javadoc  Declaration  Console
<terminated> OldSchool [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_131.jdk/Contents/Home/bin/java (Aug 9, 2017, 7:02:41 PM)
Earth
Jupiter
Mars
Venus
Saturn
Mercury
Neptune
Uranus
Dagobah
Kobol
```

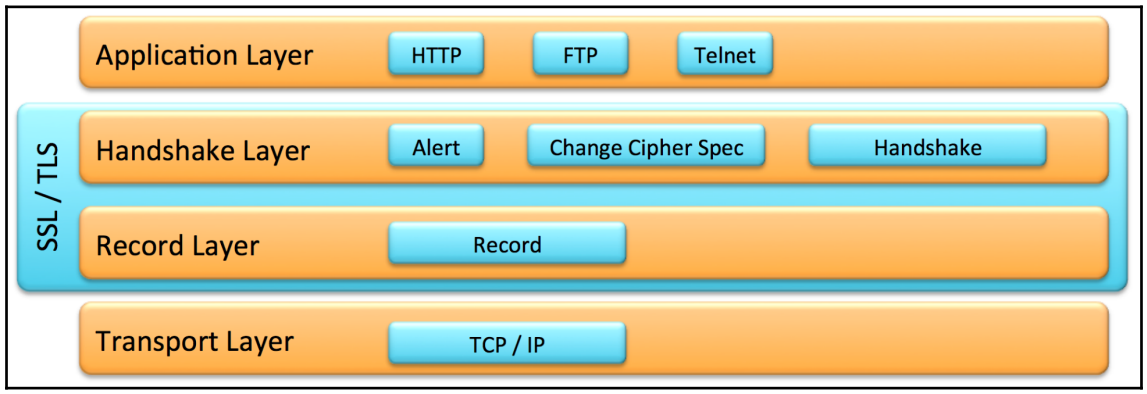

Data Stream
Applications
Asynchronous
Reacts to data

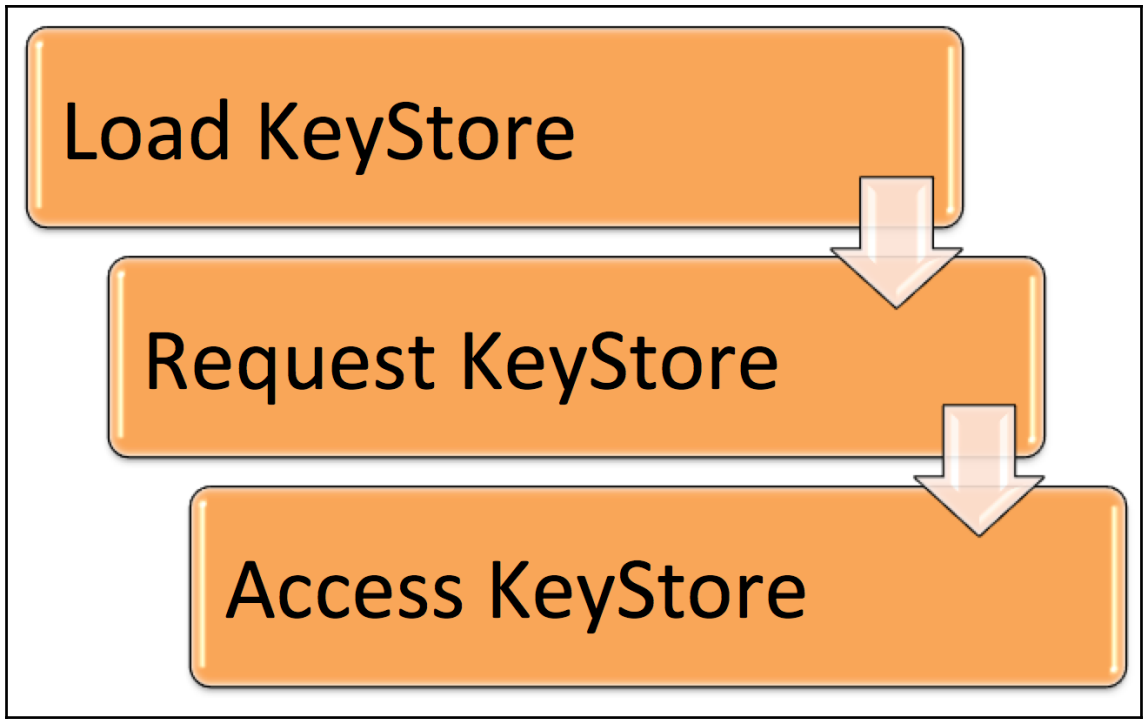

Publisher
Subscriber
Data Stream
Processors
Applications
Asynchronous
Reacts to data

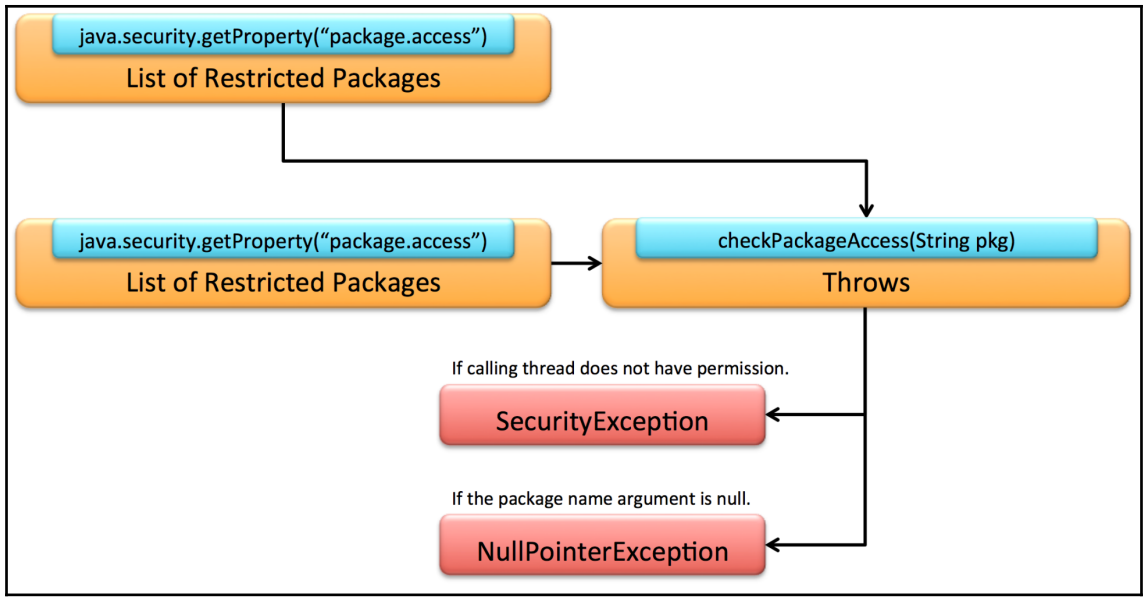

Shared Memory
Processors

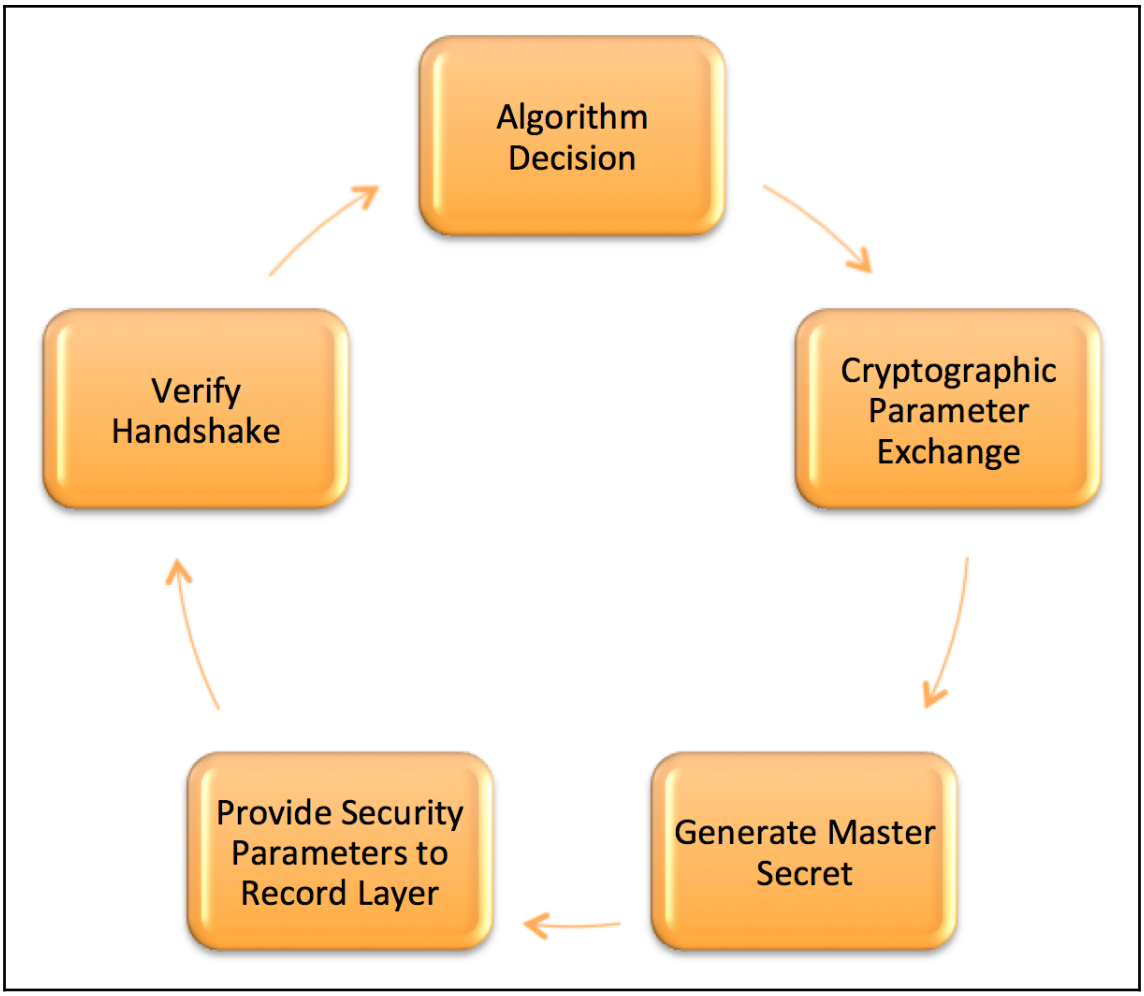

Processor
Memory
Processor
Memory
Processor
Memory
Processor
Memory
Processor
Memory
Processor
Memory

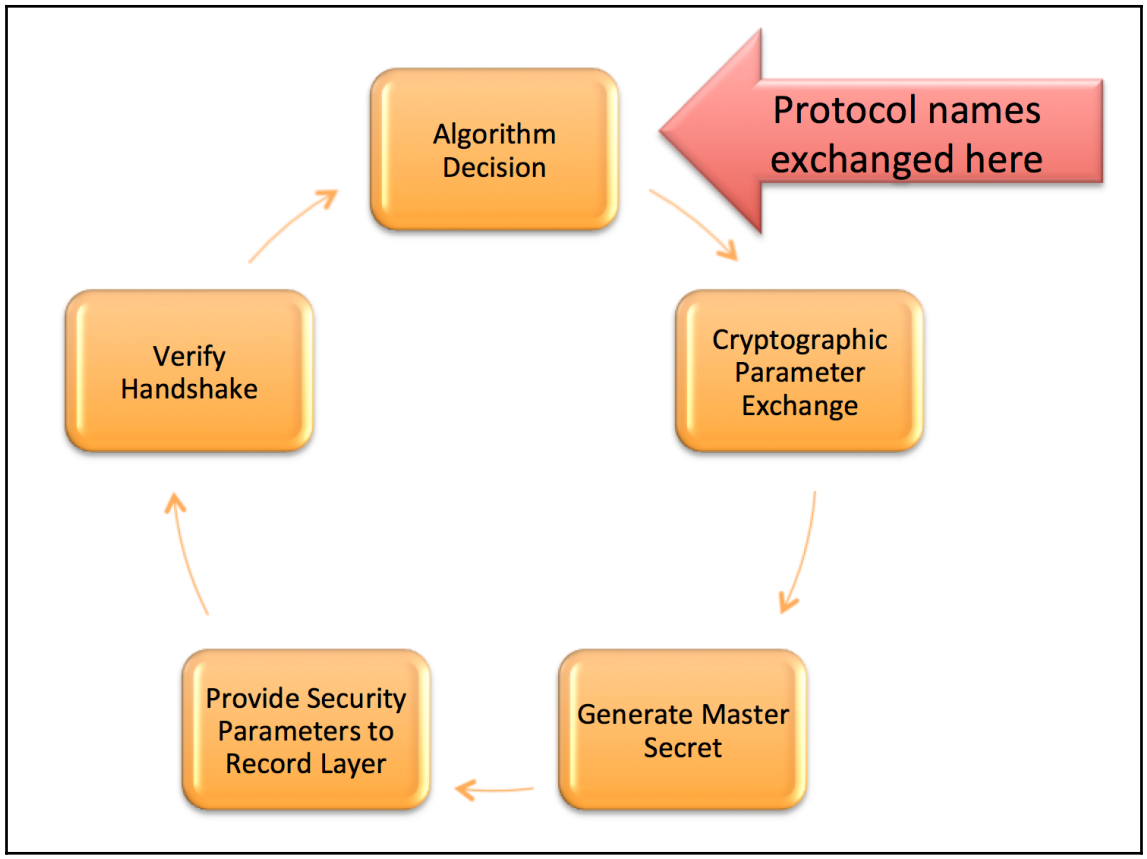
Chapter 13: Security Enhancements

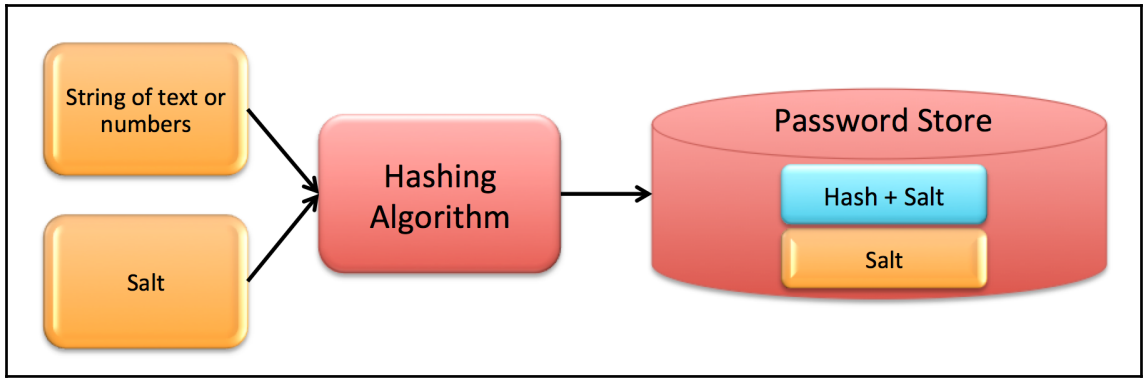


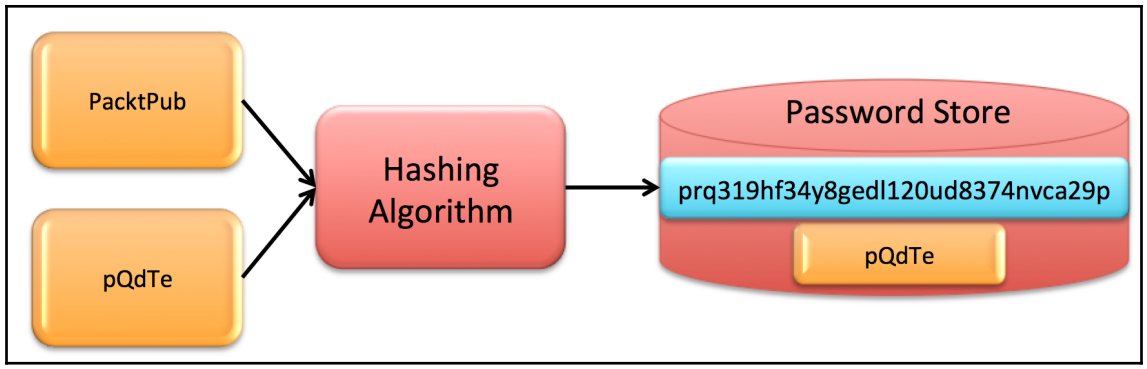


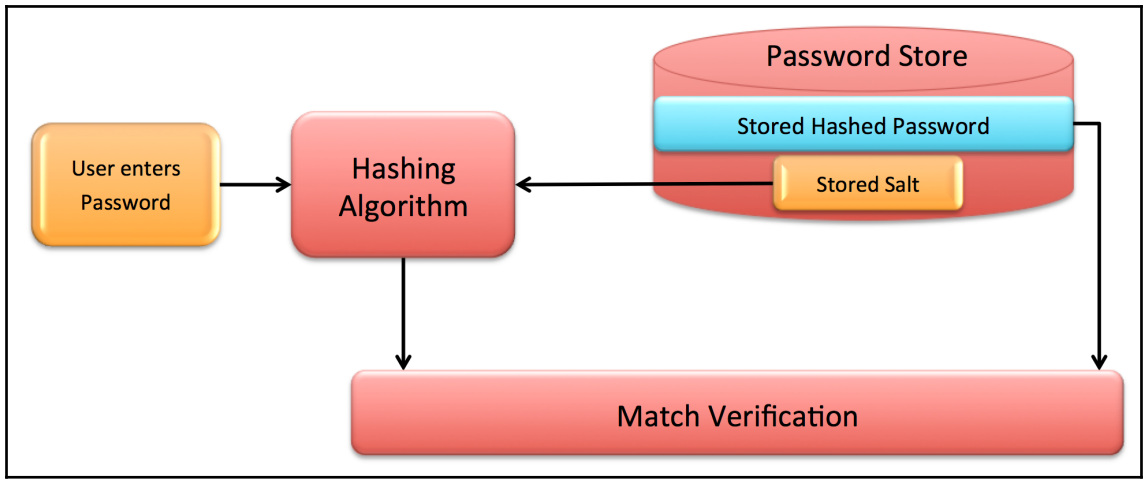

java.security.getProperty("package.access")
List of Restricted Packages
java.security.getProperty("package.access")
List of Restricted Packages
checkPackageAccess(String pkg)
Throws
If calling thread does not have permission.
SecurityException
If the package name argument is null.
NullPointerException

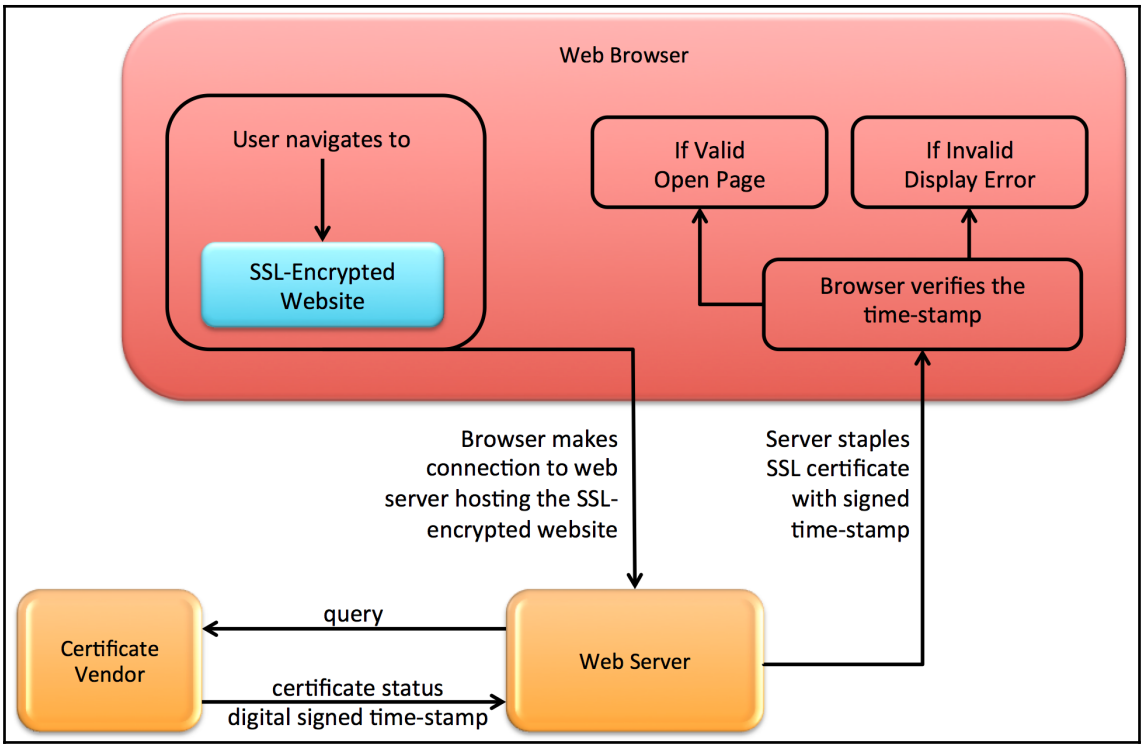

Algorithm Decision
Cryptographic Parameter Exchange
Generate Master Secret
Provide Security Parameters to Record Layer
Verify Handshake


Algorithm Decision
Protocol names exchanged here
Cryptographic Parameter Exchange
Generate Master Secret
Provide Security Parameters to Record Layer
Verify Handshake

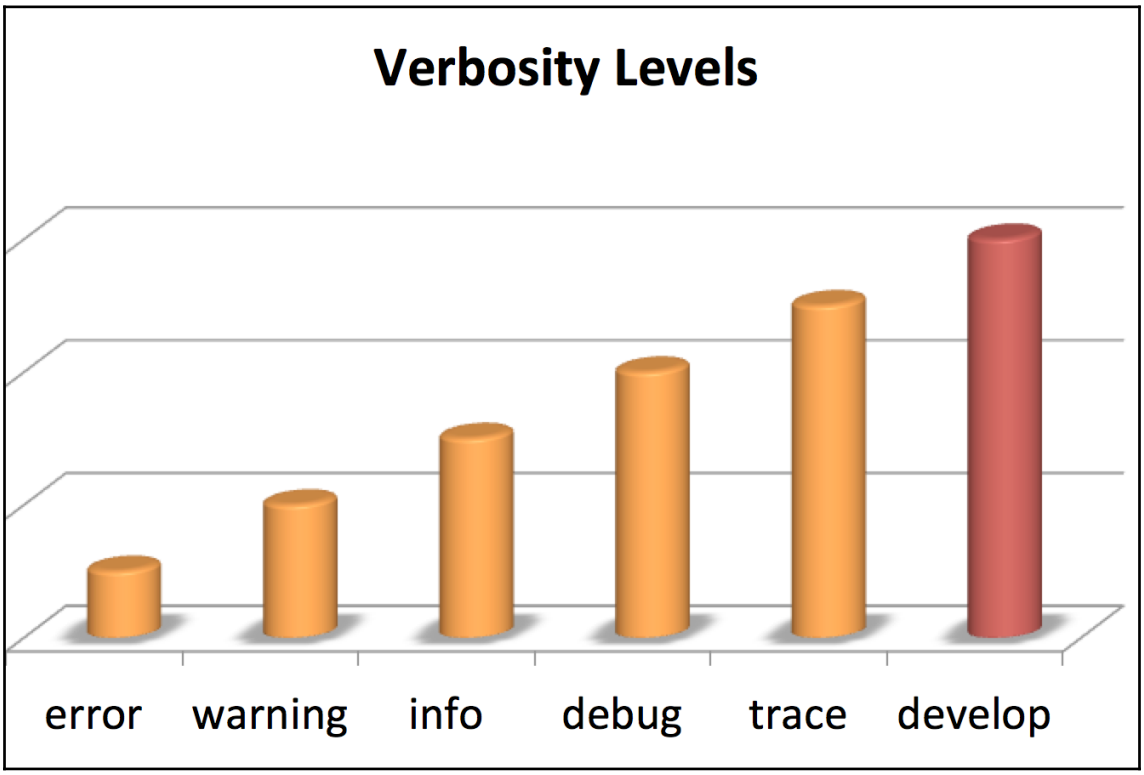

String of text or numbers
Salt
Hashing Algorithm
Password Store
Hash + Salt
Salt

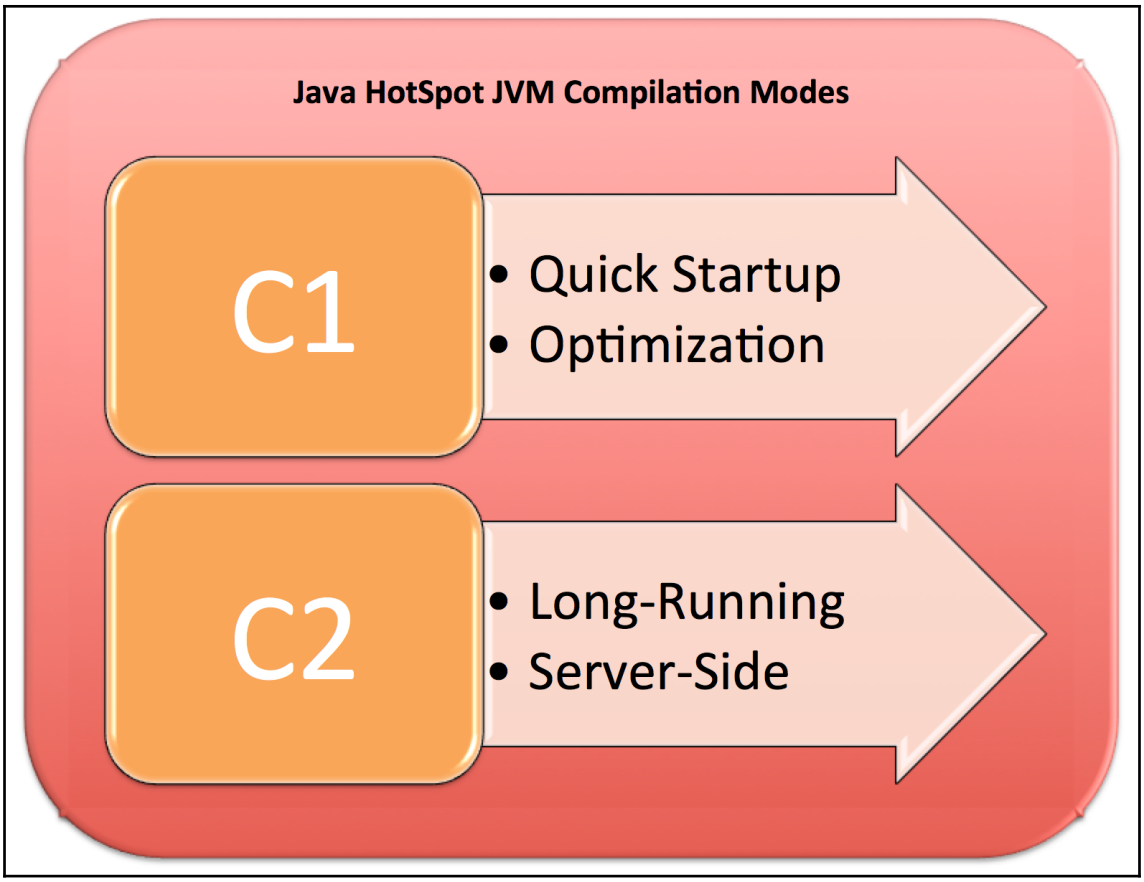

PacktPub
pQdTe
Hashing Algorithm
Password Store
prq319hf34y8gedl120ud8374nvca29p
pQdTe

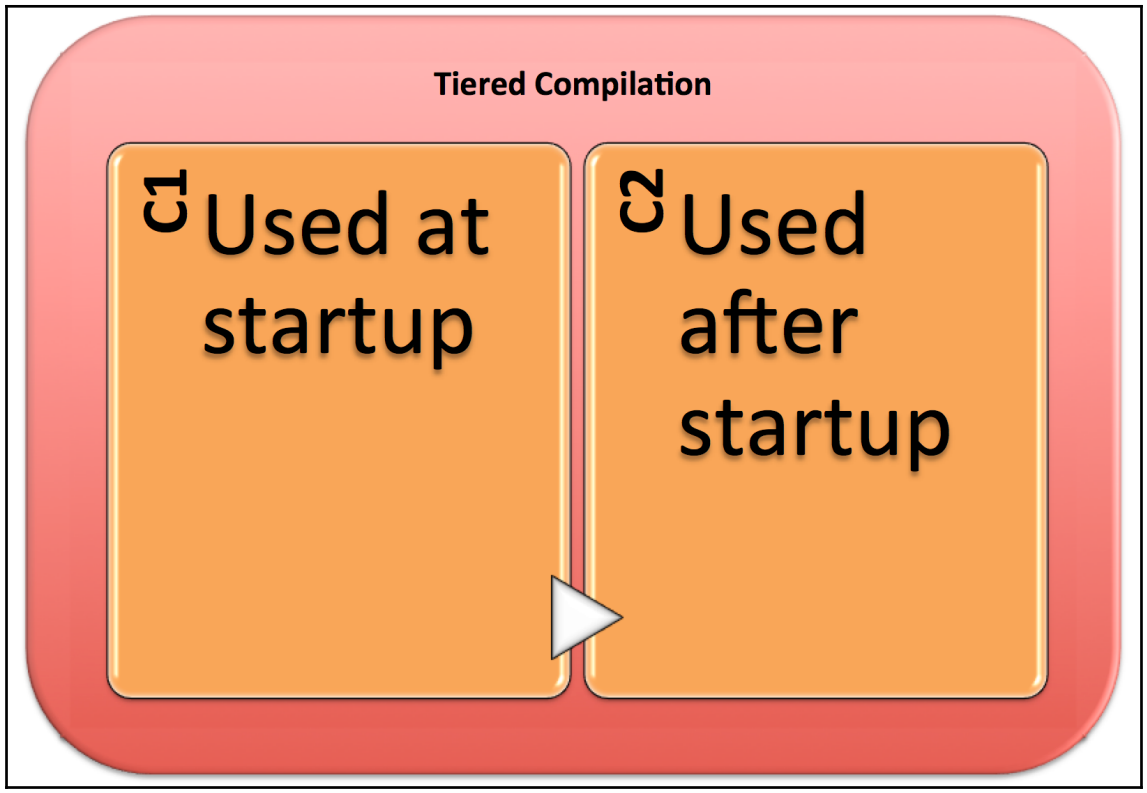

User enters Password
Hashing Algorithm
Password Store
Stored Hashed Password
Stored Salt
Match Verification

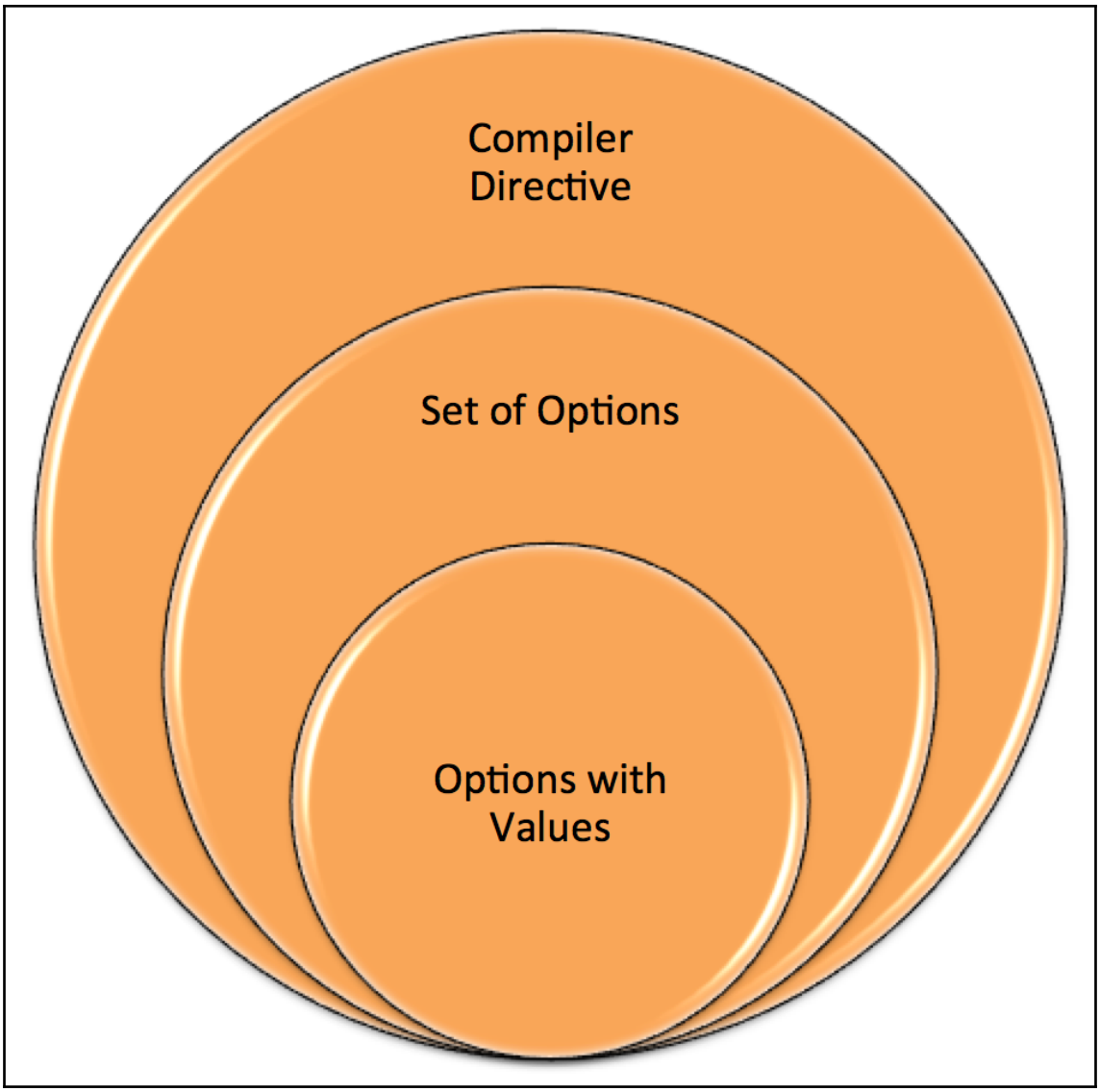

Web Browser
User navigates to
SSL-Encrypted Website
If Valid Open Page
If Invalid Display Error
Browser verifies the time-stamp
Browser makes connection to web server hosting the SSL-encrypted website
Server staples SSL certificate with signed time-stamp
Certificate Vendor
query
certificate status
digital signed time-stamp
Web Server

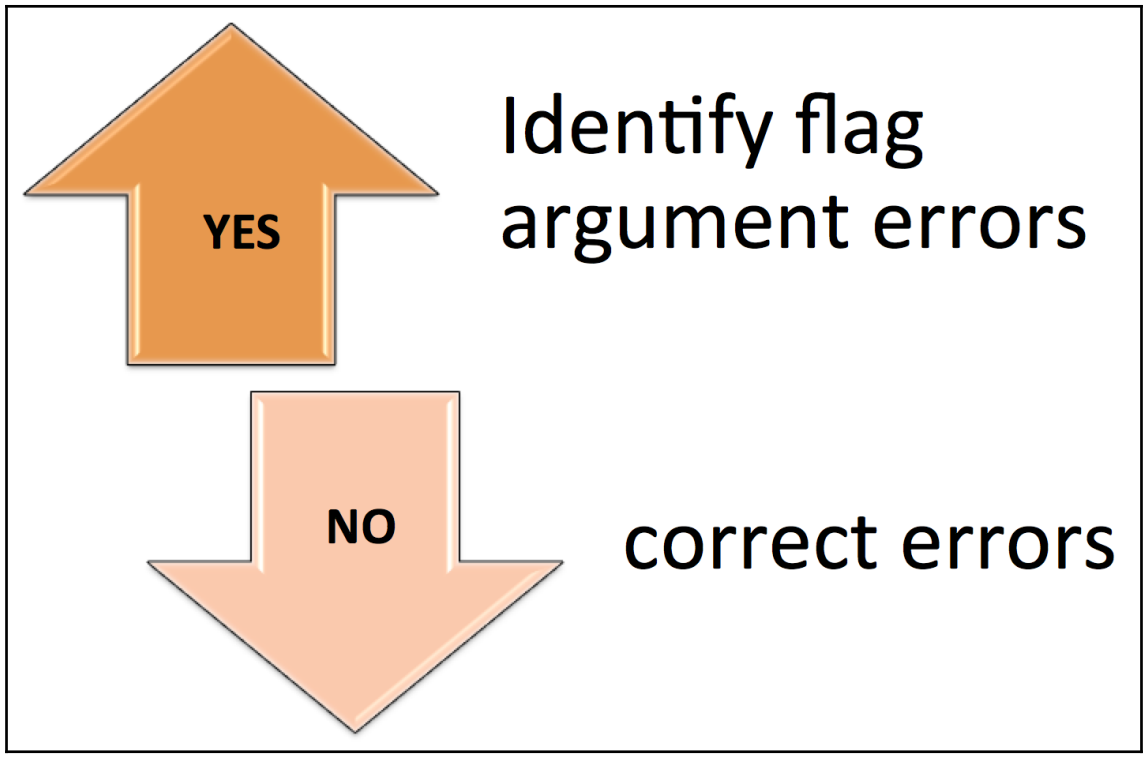
Chapter 14: Command-Line Flags

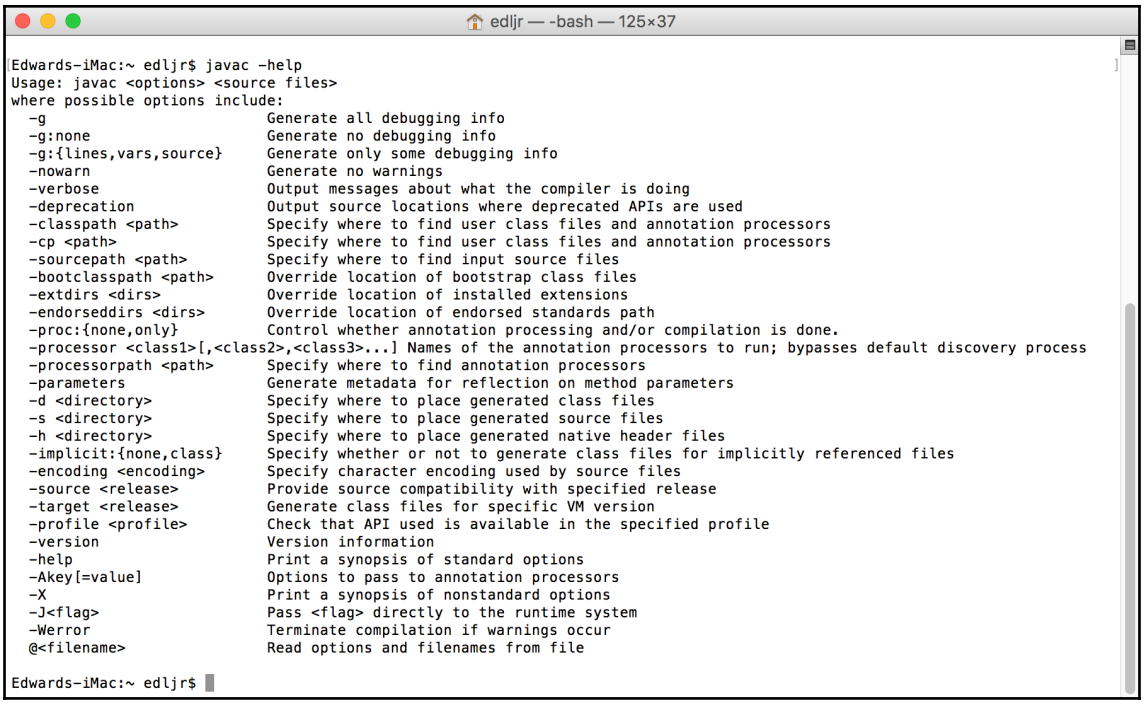


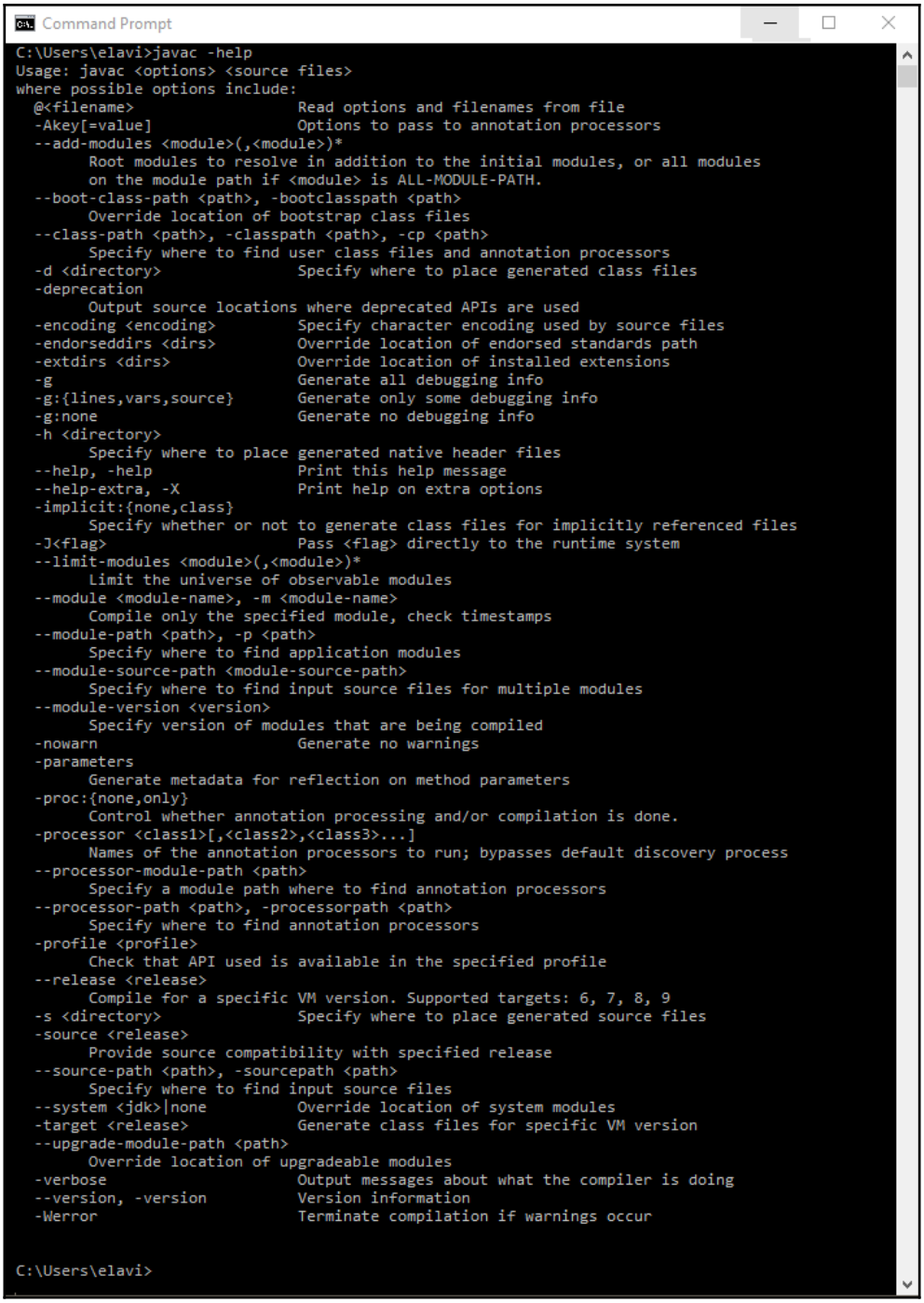

Java HotSpot JVM Compilation Modes
C1
• Quick Startup
• Optimization
C2
• Long-Running
• Server-Side


Tiered Compilation
C1 Used at startup
C2 Used after startup

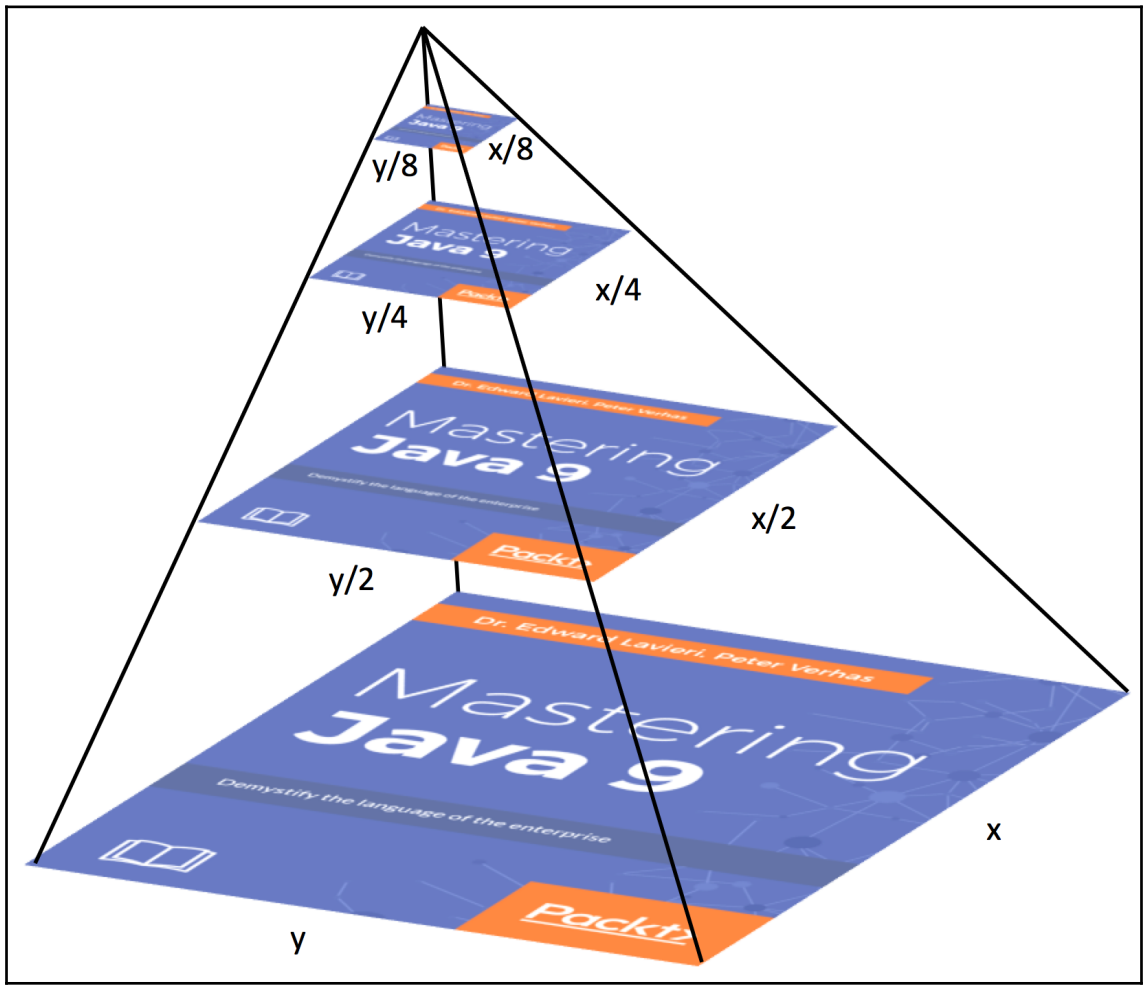

Compiler
Directive
Set of Options
Options with
Values


YES
Identify flag argument errors
NO
correct errors


edljr — -bash — 125×37
Edwards-iMac:~ edljr$ javac -help
Usage: javac <options> <source files>
where possible options include:
  -g   Generate all debugging info
  -g:none   Generate no debugging info
  -g:{lines,vars,source}   Generate only some debugging info
  -nowarn   Generate no warnings
  -verbose   Output messages about what the compiler is doing
  -deprecation   Output source locations where deprecated APIs are used
  -classpath <path>   Specify where to find user class files and annotation processors
  -cp <path>   Specify where to find user class files and annotation processors
  -sourcepath <path>   Specify where to find input source files
  -bootclasspath <path>   Override location of bootstrap class files
  -extdirs <dirs>   Override location of installed extensions
  -endorseddirs <dirs>   Override location of endorsed standards path
  -proc:{none,only}   Control whether annotation processing and/or compilation is done.
  -processor <class1>[,<class2>,<class3>...] Names of the annotation processors to run; bypasses default discovery process
  -processorpath <path>   Specify where to find annotation processors
  -parameters   Generate metadata for reflection on method parameters
  -d <directory>   Specify where to place generated class files
  -s <directory>   Specify where to place generated source files
  -h <directory>   Specify where to place generated native header files
  -implicit:{none,class}   Specify whether or not to generate class files for implicitly referenced files
  -encoding <encoding>   Specify character encoding used by source files
  -source <release>   Provide source compatibility with specified release
  -target <release>   Generate class files for specific VM version
  -profile <profile>   Check that API used is available in the specified profile
  -version   Version information
  -help   Print a synopsis of standard options
  -Akey[=value]   Options to pass to annotation processors
  -X   Print a synopsis of nonstandard options
  -J<flag>   Pass <flag> directly to the runtime system
  -Werror   Terminate compilation if warnings occur
  @<filename>   Read options and filenames from file
Edwards-iMac:~ edljr$


Command Prompt
C:\Users\elavi>javac -help
Usage: javac <options> <source files>
where possible options include:
  @<filename>   Read options and filenames from file
  -Akey[=value]   Options to pass to annotation processors
  --add-modules <module>(,<module>)*
        Root modules to resolve in addition to the initial modules, or all modules
        on the module path if <module> is ALL-MODULE-PATH.
  --boot-class-path <path>, -bootclasspath <path>
        Override location of bootstrap class files
  --class-path <path>, -classpath <path>, -cp <path>
        Specify where to find user class files and annotation processors
  -d <directory>   Specify where to place generated class files
  -deprecation
        Output source locations where deprecated APIs are used
  -encoding <encoding>   Specify character encoding used by source files
  -endorseddirs <dirs>   Override location of endorsed standards path
  -extdirs <dirs>   Override location of installed extensions
  -g   Generate all debugging info
  -g:{lines,vars,source}   Generate only some debugging info
  -g:none   Generate no debugging info
  -h <directory>
        Specify where to place generated native header files
  --help, -help   Print this help message
  --help-extra, -X   Print help on extra options
  -implicit:{none,class}
        Specify whether or not to generate class files for implicitly referenced files
  -J<flag>   Pass <flag> directly to the runtime system
  --limit-modules <module>(,<module>)*
        Limit the universe of observable modules
  --module <module-name>, -m <module-name>
        Compile only the specified module, check timestamps
  --module-path <path>, -p <path>
        Specify where to find application modules
  --module-source-path <module-source-path>
        Specify where to find input source files for multiple modules
  --module-version <version>
        Specify version of modules that are being compiled
  -nowarn   Generate no warnings
  -parameters
        Generate metadata for reflection on method parameters
  -proc:{none,only}
        Control whether annotation processing and/or compilation is done.
  -processor <class1>[,<class2>,<class3>...]
        Names of the annotation processors to run; bypasses default discovery process
  --processor-module-path <path>
        Specify a module path where to find annotation processors
  --processor-path <path>, -processorpath <path>
        Specify where to find annotation processors
  -profile <profile>
        Check that API used is available in the specified profile
  --release <release>
        Compile for a specific VM version. Supported targets: 6, 7, 8, 9
  -s <directory>   Specify where to place generated source files
  -source <release>
        Provide source compatibility with specified release
  --source-path <path>, -sourcepath <path>
        Specify where to find input source files
  --system <jdk>|none   Override location of system modules
  -target <release>   Generate class files for specific VM version
  --upgrade-module-path <path>
        Override location of upgradeable modules
  -verbose   Output messages about what the compiler is doing
  --version, -version   Version information
  -Werror   Terminate compilation if warnings occur
C:\Users\elavi>

Chapter 15: Additional Enhancements to the Java Platform



Chapter 16: Future Directions

No Images.

Chapter 17: Contributing to the Java Platform

No Images.