Ammonite: Succinct Scala Shell Scripting

Markus Dale, medale@asymmetrik.com

October 2019

- Slides: https://github.com/medale/prez-ammonite-scala-shell/blob/master/presentation/AmmoniteShell.pdf
- Code Examples: https://github.com/medale/prez-ammonite-scala-shell/code

- Automate a small but labor-intensive task
- Run clean-up jobs with cron
- Refresh all git repositories (git pull)
- build and publish all projects under a common dir

```bash
# 3041 upvotes for question, 4259 for answer
if [ ! -f CommonImports.sc ]; then
    echo "File not found!"
fi
# elif?


find . -name *.foo -exec rm -f {} \;
```

```scala
import java.nio.file._

val f = Paths.get("CommonImports.sc")
if (!Files.exists(f)) {
  println("File not found!")
}
```

```scala
import java.nio.file._
import scala.collection.JavaConverters._

val cwd = Paths.get(sys.props("user.dir"))
val filesStream = Files.walk(cwd)
val files = filesStream.iterator.asScala.toList
val fooFiles = files.filter(_.toString.endsWith(".foo"))
fooFiles.foreach(Files.delete(_))

filesStream.close
```

```
if (!exists("CommonImports.sc")) {
   println("File not found!")
}

//also: cd!, ls!, rm!, mv!...
```

Installing Ammonite

- Prerequisite: Java 8 JDK in your path, e.g. from Azul Zulu Community Java 8
- Download 1.7.4 (2.12 or 2.13) binary from https://github.com/lihaoyi/Ammonite/releases
- Add as amm to your path
    - 1.6.7. last 2.11 version (if you are running older version of Spark...)
    - Can install multiple versions locally

```
cd ~/bin
ln -s amm212 amm
ls -l
amm -> amm212
amm211
amm212
```

- From ammonite.io via curl

```
sudo sh -c '(echo "#!/usr/bin/env sh" && curl -L \
 https://github.com/lihaoyi/Ammonite/releases/download/1.7.4/2.13-1.7.4) > \
/usr/local/bin/amm && chmod +x /usr/local/bin/amm' && amm
```

- On Mac: `brew install ammonite-repl`
- Windows:

    https://github.com/lihaoyi/Ammonite/issues/119

Configure the shell ~/.ammonite/predef.sc

- Ammonite source: https://github.com/lihaoyi/Ammonite
- shell/src/main/resources/ammonite/shell/example-predef.sc

```
interp.load.ivy(
  "com.lihaoyi" %
  s"ammonite-shell_${scala.util.Properties.versionNumberString}" %
  ammonite.Constants.version
)
@
val shellSession = ammonite.shell.ShellSession()
import shellSession._
import ammonite.ops._
import ammonite.shell._
ammonite.shell.Configure(interp, repl, wd)
```

Running Ammonite with extra memory

```
amm

JAVA_OPTS=-Xmx10g; amm
```

- input and output code syntax highlighting
- output valid Scala code
- multi-line editing - move one statement at a time
- statement history search (by word/prefix + up arrow)
- Classpath search

- vals, function defs, classes, objects or traits (not import statements)

```scala
import $file.CommonImports   //in current dir

import $file.scripts.Utils   //in subdir scripts

import $file.^.print         //in parent dir
```

```scala
//contains: import java.nio.file._

import $exec.CommonImports
Paths.get("foo")
import CommonImports._
printWithNewlines(List(1,2,3))
```

Magic import $ivy: Download libraries and their dependencies

```
import $ivy.`com.univocity:<TAB>`
`com.univocity:univocity-api
`com.univocity:univocity-parsers
`com.univocity:univocity-common-api
`com.univocity:univocity-common-parser-api

import $ivy.`com.univocity:univocity-parsers:<TAB>`
`com.univocity:univocity-parsers:1.0.0
`com.univocity:univocity-parsers:1.5.2
`com.univocity:univocity-parsers:2.3.1

import $ivy.`com.univocity:univocity-parsers:2.8.3`
```

- `repl.imports` - user imports only
- `repl.fullImports` - also shows Ammonite imports
- `repl.clipboard.read/write`

- `interp.load.cp('lib/"baz.jar")` - load a jar from file system

```
Path("/tmp")
res27: Path = root/'tmp

RelPath("lib")
res28: RelPath = 'lib

RelPath("/lib")
IllegalArgumentException: /lib is not an relative path

Path("temp")
IllegalArgumentException: temp is not an absolute path

ls! "lib"
desugar(ls! "lib")
```

- home - `$HOME or user.home`
- root - `ls! root` == Bash: `ls /`
- pwd - `sys.props("user.dir")` //does not change
- wd - changes with cd! command
- up - `..` in path, e.g. `root/'tmp/up` == `root`

- `ls! == ls! wd == ls(wd)`
- `rm! dir` - Bash: `rm -R dir`
- `cp(src,dest)`
- `mv(src,dest)`
- `mkdir! newDirPath` - Bash: `mkdir -p newDir`
- `stat! filePath`

- Print output to console: `%`
    - `%git 'status`
    - `%git("status", "--help")`
- Output to `CommandResult` object: `%%`
    - `cmdRes.exitCode`, `.out`, `.err`

- | - map
- || - flatMap
- |? - filter
- |& - reduce
- |! - foreach
- `ls! wd |? grep! "[Ff]oo".r`

- upickle - JSON and serialization/deserialization
- requests-scala - HTTP/S REST calls

- WikipediaVocab.sc
- Spreadsheet.sc

- Screening saves lives!
    - Colonoscopy - talk to your doc
    - Dave Barry: A journey into my colon — and yours
- Colorectal Cancer Alliance
- Ora Lee Smith Cancer Research Foundation

- medale@asymmetrik.com
- https://github.com/medale/prez-ammonite-scala-shell/blob/master/presentation/AmmoniteShell.pdf

- Ammonite Shell
- Vector graphics for this presentation