

Speaker Notes: Ammonite: Succinct Scala Shell Scripting

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- Open Ammonite site <https://ammonite.io>
- Download page: <https://github.com/lihaoyi/Ammonite/releases>
- Requests lib: <https://github.com/lihaoyi/requests-scala>
- CSV data: https://catalog.data.gov/dataset?res_format=CSV&page=2,
<https://data.ny.gov/api/views/e8ky-4vqe/rows.csv?accessType=DOWNLOAD>

- Bio:
 - mostly Java, big data with Hadoop
 - big data with Spark, Databricks, Scala
 - Now Asymmetrik - Scala, Spark, Elasticsearch, Akka...
 - Data Engineer
 - Slides: <https://github.com/medale/prez-ammonite-scala-shell/blob/master/presentation/SparkDataEngineering.pdf>
 - Code Examples:
<https://github.com/medale/prez-ammonite-scala-shell/code>

Examples of Shell Scripting

- 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

- hard to remember if not used all the time
- each command has its own set of options
- Can pipe things together - very useful
- No types - mostly treated as strings (other than exit code)
- Dr. Google - but fragile to maintain

- Use java import
- More verbose

- from 1 liner to 8 (and don't forget close)

- Domain-specific language for Scala shell scripting
- Make common tasks as terse as possible (but typed)
- imports Scala commands and implicits to convert strings to paths
- spawn subprocesses and pipes
- additional ease of use to remove need for full project/build system

- Open <https://github.com/lihaoyi/Ammonite/releases>

Other ways of installing Ammonite

Configure the shell `~/.ammonite/predef.sc`

Major improvements over Scala REPL

- open Scala REPL and Ammonite
- Syntax highlighting input/output
- output valid Scala code: `Seq.fill(10)("Hello, Ammonite")`
- multi-line editing (up arrow and search)
- Classpath search: `StandardCharsets<TAB>` (if not imported yet but on classpath)

Magic import \$file: Importing scripts

```
import $file.CommonImports
CommonImports.printCwd //accesses Paths OK
Paths.get("foo") //no imports - error
CommonImports.printWithNewlines(List(1,2,3))
```

```
import $file.scripts.Utills
Utills.du()
import Utills._
du()
```

```
import $file.^..print
print.message()
```

Magic import \$exec: Bring in the defs AND imports

- all definitions AND import statements

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

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

Magic import \$ivy: Download libraries and their dependencies

```
import $ivy.`com.univocity:<TAB>`
```

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

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

```
CsvParser<TAB>
```

```
import com.univocity.parsers.csv.CsvParser
```

```
...
```

```
repl.imports      //user imports only  
repl.fullImports  //also Ammonite imports  
  
repl.clipboard.read/write  
  
repl.clipboard.write("Hello from Ammonite")  
  
repl.ssess.save("clean")  
repl.ssess.load("clean")
```



```
interp.load.cp('lib/"baz.jar")
```

```
import foo.bar.Baz
```

```
Baz.VeryImportantNumber
```

```
source(Baz)
```

```
import java.net.URL
```

```
source(URL) //no - has to be object
```

```
source(new URL("http://foo.bar"))
```

```
Path("/tmp")
```

```
RelPath("lib")
```

```
Path("temp")
```

```
RelPath("/lib")
```

```
val dir = "/tmp/rest"
```

```
ls! dir //no
```

```
Path("/tmp/rest")
```

```
root/'tmp/'rest
```

Special path variables

- 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`

- `write` <https://github.com/lihaoyi/os-lib/blob/master/os/src/os/Source.scala>

```
val imports = read("CommonImports.sc")
val lines = read.lines("CommonImports.sc")
val in = read.getInputStream("CommonImports.sc")

import $ivy.`com.typesafe.akka::akka-http:10.1.9`
val app = read(resource / "reference.conf")
```

```
%git 'status'  
%git("status", "--help")  
%%git("status", "--help")
```

Pipes and grep!

```
ls! wd | grep! ".*\\.sc".r //error two implicits
def isFile(f: Path) = f.isFile
val allFiles = ls.rec! wd |? isFile | read
browse(allFiles)
//flatMap - Seq[GrepResult]
ls! wd || grep! ".*\\.sc".r
//filter - Seq[Path] implicit to Boolean
ls! wd |? grep! ".*\\.sc".r

def sum(a: Int, b: Int) = a + b
List(1,2,3) |& sum

ls! wd |? grep! "foo|bar".r
```

Built-in libraries: upickle and requests-scala

```
val lines =  
  read.lines('input / "ids.json", StandardCharsets.UTF_8)  
val jsons = lines.map { l =>  
  ujson.read(l)  
}  
jsons.foreach { obj =>  
  obj("source") = ujson.Str("asymmetrik")  
  obj("dest") = ujson.Num(42)  
}  
jsons.foreach { obj =>  
  obj.obj.remove("dest")  
}  
val response = requests.post("http://httpbin.org/post",  
  headers = Map("accept" -> "application/json"),  
  data = ujson.write(ujson.Obj("fp" -> "map")))
```


- WikipediaVocab.sc
- Spreadsheet.sc