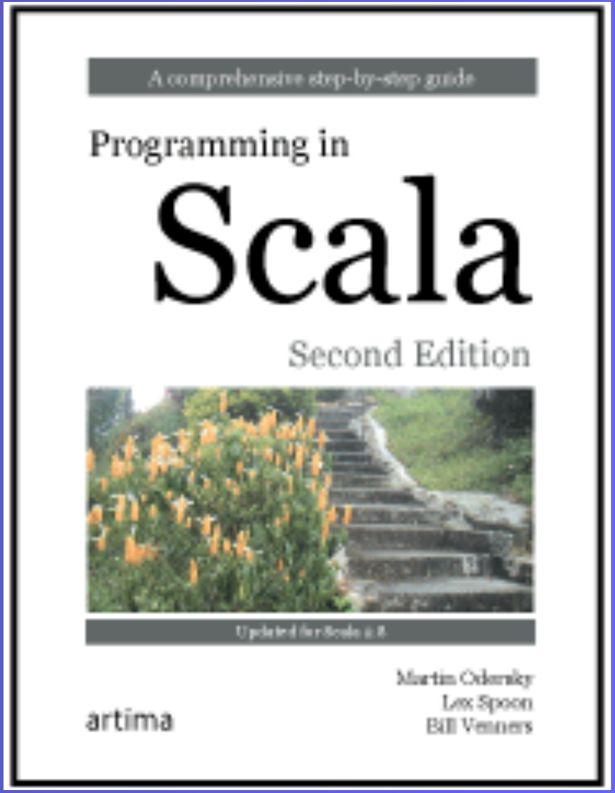
Stairway to Scala - Flight 1

First steps in Scala

Bill Venners
Dick Wall

www.artima.com



Flight 1 goal

Introduce Scala, get you used to the interactive environment and how it can be used for experimentation, and write some Scala scripts.

Scala interpreter:

```
$ scala
Welcome to Scala version 2.8.0
Type in expressions to have them evaluated.
Type :help for more information.
scala> 1 + 2
res0: Int = 3
scala> res0 * 3
res1: Int = 9
```

The classic:

```
scala> println("Hello, world!")
Hello, world!
```

Defining variables:

```
scala> val msg = "Hello, world!"
msg: java.lang.String = Hello, world!

scala> val msg: java.lang.String = "Hello, world!"
msg: java.lang.String = Hello, world!

scala> val msg: String = "Hello, world!"
msg: java.lang.String = Hello, world!
```

Vals and vars:

```
scala> println(msg)
Hello, world!

scala> msg = "Goodbye, cruel world!"
<console>:5: error: reassignment to val
msg = "Goodbye cruel world!"

scala> var greeting = "Hello, world!"
greeting: java.lang.String = Hello, world!

scala> greeting = Leave me alone, world!"
greeting: java.lang.String = Leave me alone, world!
```

Odds and ends:

```
scala> val multiLine =
| "This is the next line."
multiLine: java.lang.String = This is the next line.

scala> val oops
|
|
You typed two blank lines. Starting a new command.
```

Shell :commands

The Scala shell has several useful commands each begins with a :

:help prints up a list of the : commands

:load load up a scala file and evaluate it

:history print up a history of statements

:replay reset the shell and replay all commands (:replay will reload files as you change them!)

:sh execute a shell command (and bring any

Java's if statement:

```
if (a > b)
    System.out.println(a);
else
    System.out.println(b);
```

Java’s ternary operator:

```
int m = (a > b) ? a : b;
System.out.println(m);
```

Scala's if expression:

```
val m = if (a > b) a else b
println(m)
```

Defining a function:

```
scala> def max(x: Int, y: Int): Int = {
     |     if (x > y) x
     |     else y
         }
max: (Int,Int)Int

scala> max(3, 5)
res6: Int = 5
```

Streamlining a function:

```
scala> def max2(x: Int, y: Int) = if (x > y) x else y
max2: (Int,Int)Int

scala> def greet() = println("Hello, world!")
greet: ()Unit

scala> greet()
Hello, world!

scala> :quit
$
```

Code completion

```
scala> val s = "Hello, World"
s: java.lang.String = Hello, World
```

s.<Hit Tab!>

What happens?

Scala scripting:

In a file named helloarg.scala:

```
// Say hello to the first argument
println("Hello, " + args(0) + "!")
```

```
$ scala helloarg.scala planet
Hello, planet!
```

While loop:

```
var i = 0
while (i < args.length) {
  println(args(i))
  i += 1
}
```

```
$ scala printargs.scala Scala is fun
Scala
is
fun
```

Another while loop:

```scala
var i = 0
while (i < args.length) {
  if (i != 0) print(" ")
  print(args(i))
  i += 1
}
println()
```

```
$ scala echoargs.scala Scala is even more fun
Scala is even more fun
```

"Looping" with foreach:

```
args.foreach(arg => println(arg))

$ scala pa.scala Concise is nice
Concise
Is
nice

args.foreach((arg: String) => println(arg))

args.foreach(println)

args foreach println
```

The syntax of function literals in Scala

```
(x: Int, y: Int) => x + y
```

"Looping" with a for expression:

```
for (arg <- args)
  println(arg)
```

Exercises

1. Print hello world from the interpreter.
2. Print hello world from a script.
3. In the interpreter, define a function that takes a string and an Int, and prints the string the Int number of times.
4. Write a script with a method that prints out each of an array of Strings passed in on one line, but with each argument reversed. Use :load in the shell to try it.
5. Now alter the script to also make each argument uppercase, then use :replay to try it out. See what happens?

Exercises - extra credit

The Fibonacci Series in Mathematics can be calculated by the following formula:
fib(0) -> 0, fib(1) -> 1, fib(n) -> fib(n-1) + fib(n-2)

Write a script to complete the following definition

```
def fib(v : Int) : Int = v match {
  case 0 => // Put something in here
  case 1 => // Put something in here
  case n => // Put something in here
}
```

Don't worry too much about the match syntax for now, just fill in the blanks, and test it using :load and :replay until it works.