

Unit 3a: Scala

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1 Introduction

Scala is a modern general-purpose programming language created by Martin Odersky which first appeared in 2004 supported by Lightbend (formerly Typesafe). The name is short for “scalable language” and it is designed to grow with the demands of its users. It has strong, static typing, like Java, but with type inference and strong support for both the OO and Functional programming models.

Source code compiles to Java bytecode for execution on a JVM and can be used in compiled mode, or interactive (“interpreted” - REPL, scripts). There is also strong support for *concurrency*.

2 Working with Scala

2.1 REPL

Running the *scala* command at a command prompt starts the REPL; the *scala>* prompt allows you to type Scala expressions or statements at which are evaluated/executed immediately.

```

Administrator: Developer Command Prompt for VS2015 - scala
C:\Program Files (x86)\Microsoft Visual Studio 14.0>cd\
C:\>cd users/administrator
C:\Users\Administrator>md scalalab1
C:\Users\Administrator>cd scalalab1
C:\Users\Administrator\scalalab1>scala
Welcome to Scala 2.11.8 (Java HotSpot(TM) 64-Bit Server VM, Java 1.8.0_92).
Type in expressions for evaluation. Or try :help.

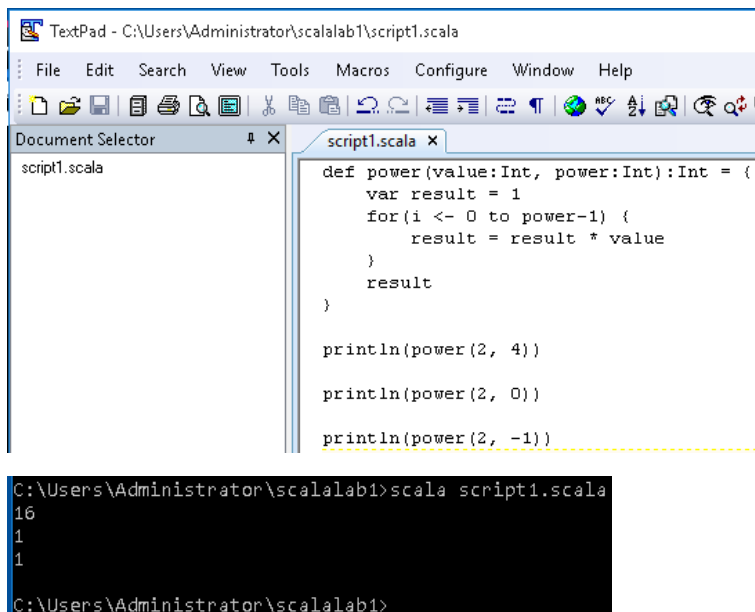
scala> val x = 10
x: Int = 10

scala> print(x)
10
scala> x = 20
<console>:12: error: reassignment to val
      x = 20
      ^
scala>

```

2.2 Scripts

Scala code in a script file can be run from the using the *scala* command at the prompt, e.g. *scala myscript.scala*.



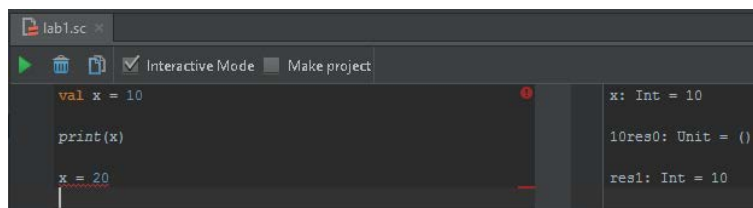
2.3 Compile

We can compile a script using the *scalac* command at the command prompt and run the compiled code with the *scala* command.

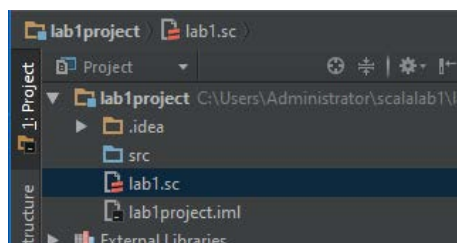
2.4 IDE

The Scala IDE is based on Eclipse; we can use **IntelliJ IDEA** with the Scala plug-in. This provides:

- Scala Worksheets – “REPL session on steroids”



- Projects – full applications - can have multiple classes, libraries etc.



2.5 sbt

This is a build tool which defines application sources, dependencies, output, etc. in a build file. Build files are written in Scala using a DSL which we will see more of later in the module. You can build

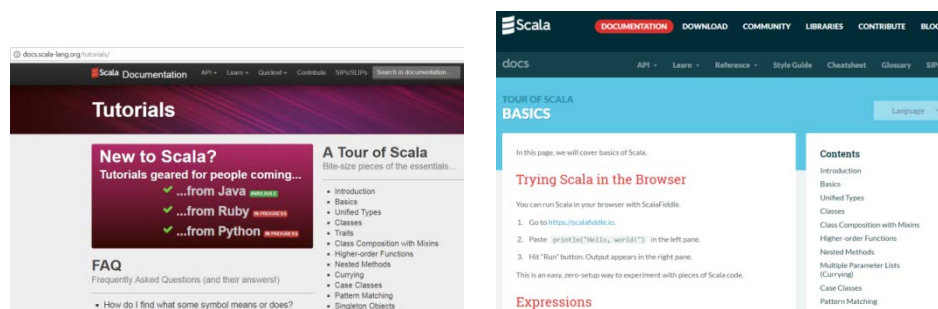
projects interactively at command line, without an IDE similar to Maven and Ant which are commonly used with Java.



3 References

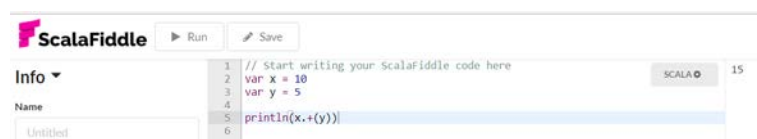
There are many useful sources of reference material to help you when you are working with Scala including the following material on the official Scala website:

- <http://docs.scala-lang.org/tutorials/> - a tour of the essentials
- <http://docs.scala-lang.org/overviews/> - a collection of useful guides and overviews
- <http://www.scala-lang.org/api/current/> - API documentation, similar to the Java API documentation



Also, the book *Programming in Scala* by Odersky, Spoon & Venners is an authoritative source, as it is co-written by the designer of the language.

A ScalaFiddle can be found at: <https://scalafiddle.io/>.



4 Summary

- Scala is an OO language that compiles to JVM bytecode
- Similar to Java in some respects, some differences are relatively small and result in more compact code
- Significant differences provide support for functional programming style:
 - Type system
 - Functions
 - Focus on expressions rather than statements
 - Powerful features for pattern matching and iteration