Scala Reference Guide

Packages

import scala.collection._ wildcard to import everything from the collection library

import scala.collection.Vector specific import for the Vector class

import scala.collection.{Vector, Sequence} import multiple classes

package pkgname declare a package

Operators

x op y is x.op(y) infix notation where op can be +, -, *, /, %

x op is x.op( ) postfix notation

x == y compares two objects (calls equals method)

There is no ++, -- in Scala

Symbols

; optional end of line

-> returns a two element tuple for a key, value pair

<- assign to in a for comprehension

=> used in function literals to separate arguments from the function body

:: cons operator

// single-line comment

/*…*/ multiline comment

Relational Operators

|| or

&& and

! not

Comparison

== equals

< less than

> greater than

<= less than or equal to

>= greater than or equal to

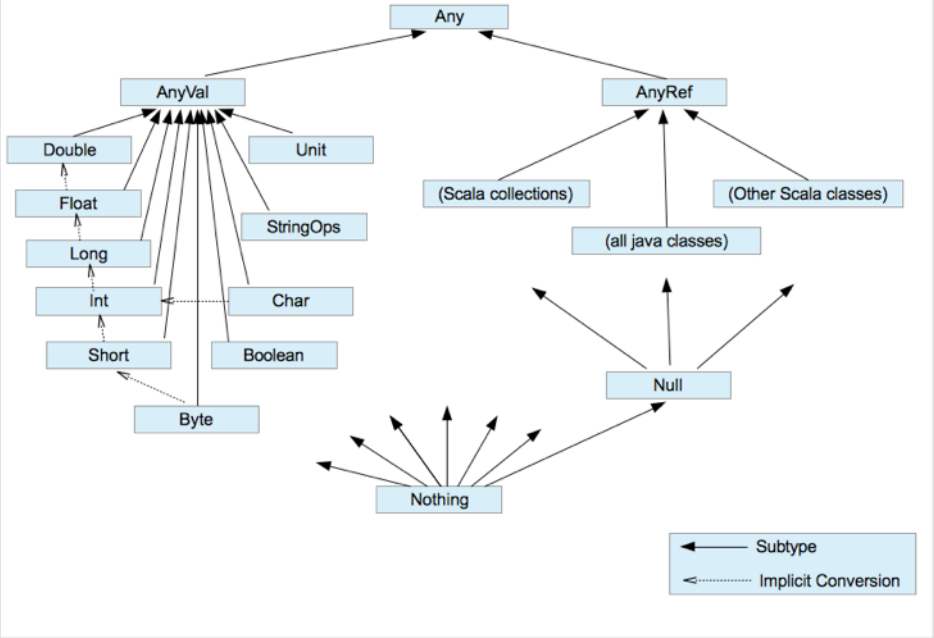
Lambda Expression

(x:Int) => x * x	anonymous function to square x
(1 to 5).map(2 * _)	anonymous function using bound infix method, multiplies 1,2,3,4,5 by 2
val x = (1 to 5).map {2 * _	multiplies each value by 2
println(x)	print x
x }	returns x (Vector (2, 4, 6, 8, 10)
(1 to 10) filter { _ % 2==0}	only returns even numbers; creates vector (2, 4, 6, 8, 10)
(1 to 10) filter { _ % 2==0} map { _ * 2}	multiplies all even values by 2; creates vector (4, 8, 12, 16, 20)

Variables

var	creates a mutable variable
var myVar:Int	creates a mutable integer variable
val	creates an immutable variable
val myVal:String	creates an immutable String variable (or val myVal = "Monday")

Data Types
Byte
Short
Int
Long
Float
Double
Boolean
String
Char
Unit
Null
Nothing
Any
AnyRef



Functions

```
def f(x:Int) = {…}          define function f, with parameter x, an integer; no return type specified
def times3(x:Int) = 3 * x
val f = (x:Int) => 3 * x    anonymous function call
def message(x:Int){     //function returns unit since it has no = sign; prints Hello world x times
for(i<-(1 to x)) println("Hello World") }
def message(x:String, intro:String ="Dear") { //use a default value for intro
        println(intro + "," + x) }
def f(x: R)                 call by value
def f(x: => R)              call by name (reference)
def sum(xs:Int*):Int = {            //return type required for recursive functions
// * indicates variable number of args
        var r = 0
        for(x <- xs) r += x
        r }
def sum(xs:Int*):Int =  //same results as above
        if(xs.length == 0) 0 else xs.head + sum(xs.tail : _*)
```

Data Structures

```
(1,2,3)                 tuple literal
var(a,b,c) = (1,2,3)    tuple unpacking via pattern matching
var xs = List(1,2,3)    creates an immutable list called xs
xs(0)                   access the element at location zero, indexing
4::List(3,2,1)          adds 4 to the front of the list creating List(4,3,2,1)
1 to 10                         range of numbers from 1 to 10 inclusive
1 until 10              range of numbers from 1 to 9, excludes upper bound
val list = List.range(1,11) creates a List of values excluding the upper bounds
```

Decision Statements

If(expr that evaluates to true/false) println("true") else println("false")

Loops

while(expr) {…}	execute a body of code while the expr is true
do{…} while(expr)	execute a body of code at least once, continue while expr is true
for(x <- myList) println(x)	print all values of x from the List called myList
for(x <- myList if x%2 == 0) yield x*10	for comprehension
for(x <- 1 to 10) {…}	

Pattern Matching

```
val x = r match {
        case '0' => …                          //match a value
        case ch if someProperty(ch) => …       //add a guard to the match criteria
        case e: Employee => …                        //match runtime type
        case (x,y) => …                              //destructures pairs
        case Some(v) => …                      //case classes have extractors
        case 0 :: tail => …                    //infix notation for extractors yielding a pair
        case _ => …                            //default case
```

Escape Sequences

\b	backspace
\t	tab
\n	newline
\r	carriage return
\"	double quote
\'	single quote
\\	backslash