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Different ways to create and populate Lists in Scala

By Alvin Alexander. Last updated: Jun 6, 2015

This is an excerpt from the *Scala Cookbook* (partially modified for the internet). This is Recipe 11.1, “Different Ways to Create and Populate a List in Scala”

Problem

You want to create and populate a `List`.

Solution

There are many ways to create and initially populate a `List`:

```
// 1
scala> val list = 1 :: 2 :: 3 :: Nil
list: List[Int] = List(1, 2, 3)

// 2
scala> val list = List(1, 2, 3)
x: List[Int] = List(1, 2, 3)

// 3a
scala> val x = List(1, 2.0, 33D, 4000L)
x: List[Double] = List(1.0, 2.0, 33.0, 4000.0)

// 3b
scala> val x = List[Number](1, 2.0, 33D, 4000L)
x: List[java.lang.Number] = List(1, 2.0, 33.0, 4000)

// 4
scala> val x = List.range(1, 10)
x: List[Int] = List(1, 2, 3, 4, 5, 6, 7, 8, 9)

scala> val x = List.range(0, 10, 2)
x: List[Int] = List(0, 2, 4, 6, 8)

// 5
scala> val x = List.fill(3)("foo")
x: List[String] = List(foo, foo, foo)

// 6
scala> val x = List.tabulate(5)(n => n * n)
x: List[Int] = List(0, 1, 4, 9, 16)

// 7
scala> val x = collection.mutable.ListBuffer(1, 2, 3).toList
x: List[Int] = List(1, 2, 3)

// 8
scala> "foo".toList
res0: List[Char] = List(f, o, o)
```

The first two approaches shown are the most common and straightforward ways to create a `List`. Examples 3a and 3b show how you can manually control the `List` type when your collection has mixed types. When the type isn’t manually set in Example 3a, it ends up as a `List[Double]`, and in 3b it’s manually set to be a `List[Number]`.

Examples 4 through 6 show different ways to create and populate a `List` with data.

Examples 7 and 8 show that many collection types also have a `toList` method that converts their data to a `List`.

Going back to the first example, it shows the `::` method for creating a `List`, which will be new to Java developers. As shown, the `::` method (called "cons") takes two arguments: a head element, which is a single element, and a tail, which is another `List`. When a `List` is constructed like this, it must end with a `Nil` element.

It's important to know that the Scala `List` class is not like Java `List` classes, such as the Java `ArrayList`. For example, Recipe 17.1, "Going to and from Java Collections" shows that a *java.util.List* converts to a Scala `Buffer` or `Seq`, not a Scala `List`.

The following quote from the Scala `List` Scaladoc discusses the important properties of the `List` class:

> "This class is optimal for last-in-first-out (LIFO), stack-like access patterns. If you need another access pattern, for example, random access or FIFO, consider using a collection more suited to this than `List`. `List` has O(1) prepend and head/tail access. Most other operations are O(n) on the number of elements in the list."

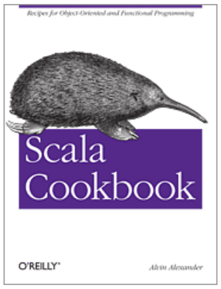
See Recipe 10.4, "Understanding the Performance of Collections" for more information on the `List` performance characteristics.

See Also

- The `List` class
- Recipe 3.15, "Working with a List in a Match Expression" shows how to handle a `List` in a match expression, especially the Nil element
- Recipe 10.4, "Understanding the Performance of Collections" discusses `List` class performance
- Recipe 17.1, "Going to and from Java Collections" demonstrates how to convert back and forth between Scala and Java collections

The Scala Cookbook

This tutorial is sponsored by the *Scala Cookbook*, which I wrote for O'Reilly:



You can find the Scala Cookbook at these locations:

- Here on the O'Reilly website, and
- Here on Amazon.com

tags: collection cons create declare fill list nil populate range scala scala scala cookbook tabulate

related

- How to merge (concatenate) Lists in Scala

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creating javabeans
importing java code
multiple constructors
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equivalent of java .class
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- show more methods in repl
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- paste multiline commands in repl

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- imap client with search

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- How to use a Range in Scala (Range class examples)
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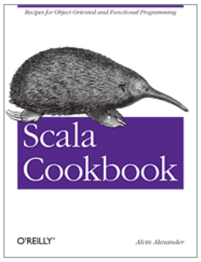

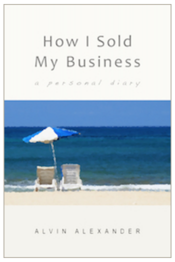

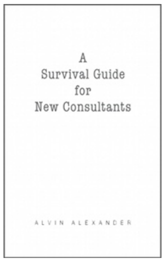

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