Scala Cheat Sheet

1 Scala Class Hierarchy

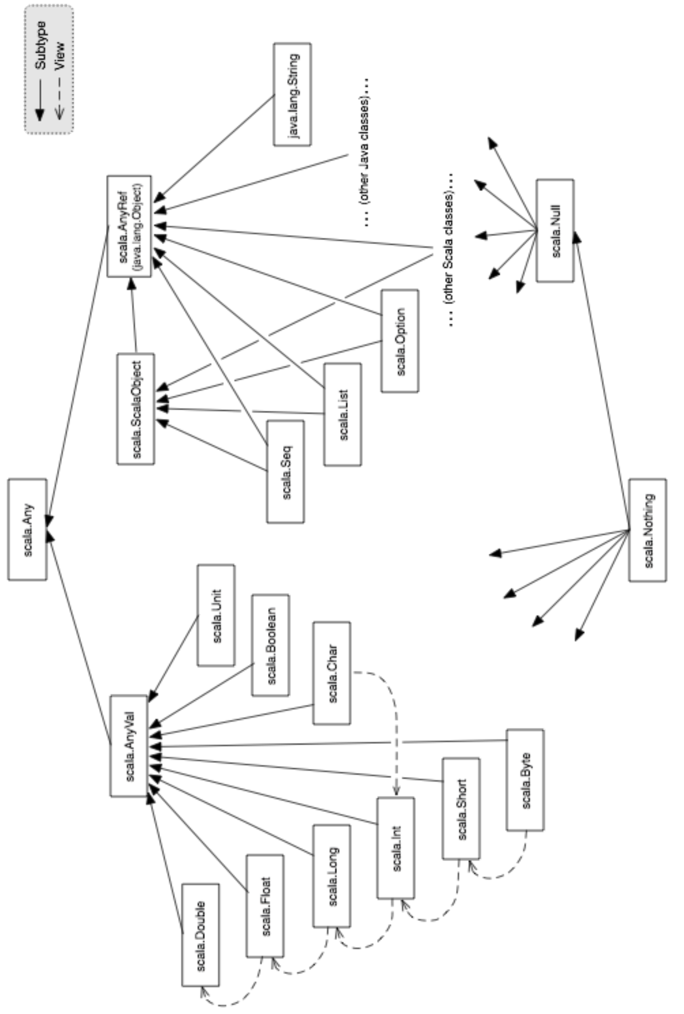
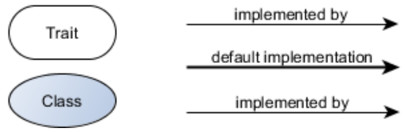


Figure 1: Scala class hierarchy, source: `http://www.scala-lang.org/old/node/128`

2 Scala Collections

2.1 Scala Collections Hierarchy



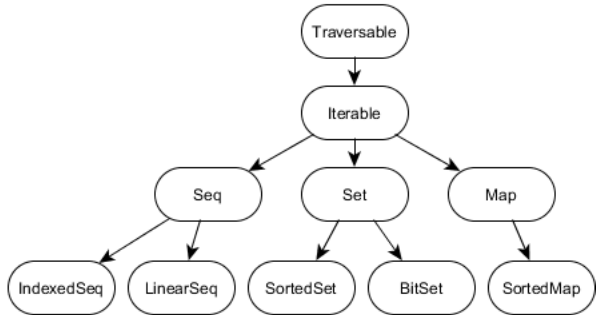


Figure 2: scala.collection

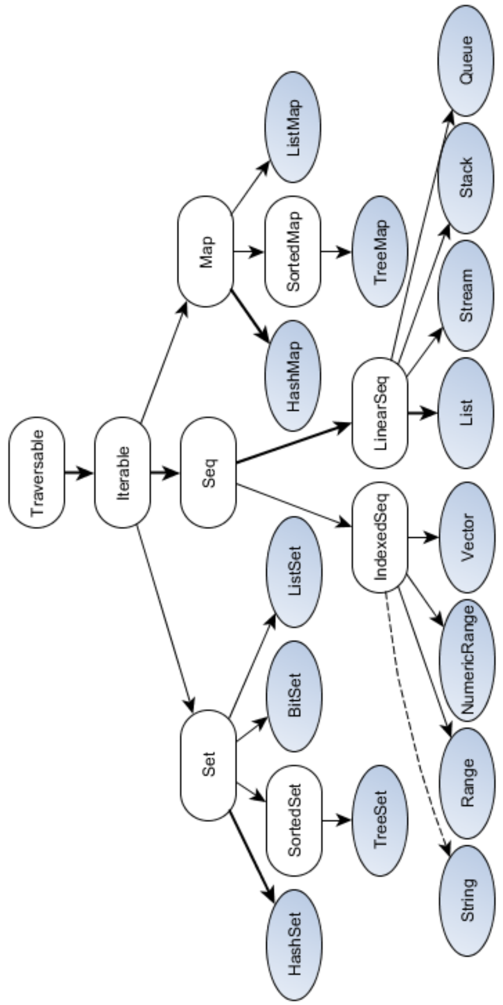


Figure 3: scala.collection.immutable

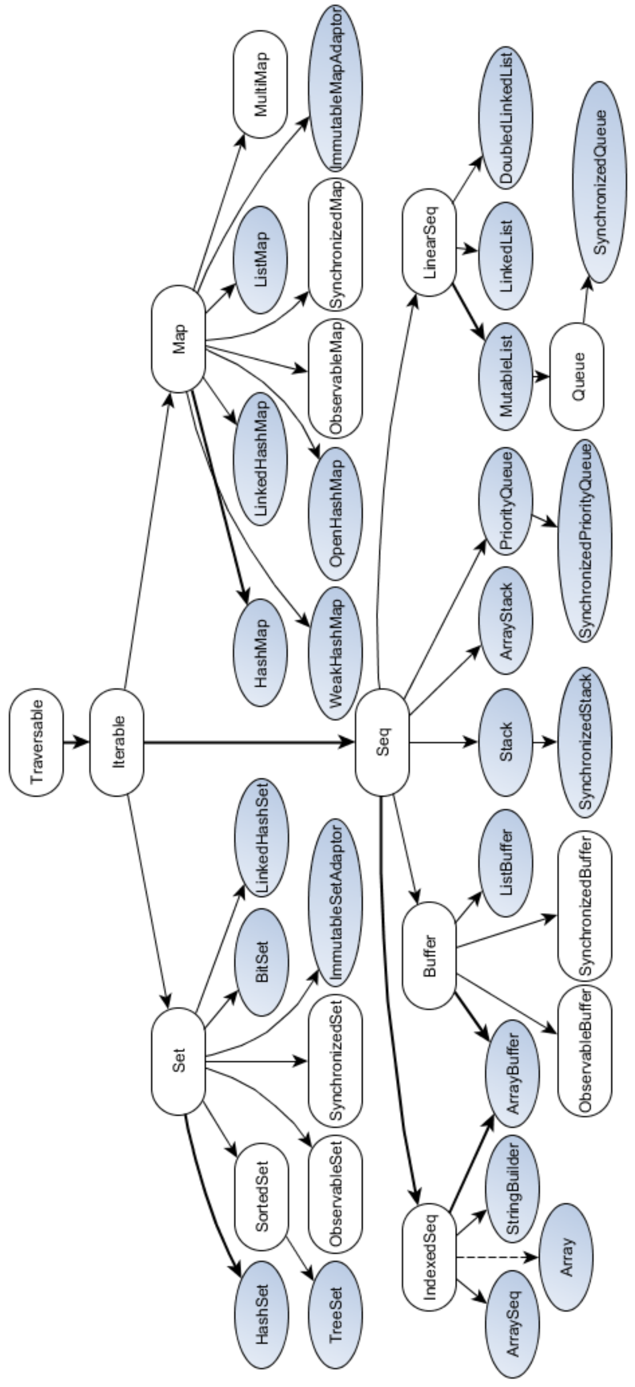


Figure 4: scala.collection.mutable

2.2 Trait `Traversable`

Table 1: Methods in `Traversable`

Category	Methods
Abstract	`xs foreach f`
Addition	`xs ++ ys`
Maps	`xs map f, xs flatMap f, xs collect f`
Conversions	`toArray, toList, toIterable, toSeq, toIndexedSeq, toStream, toSet, toMap`
Size info	`isEmpty, nonEmpty, size, hasDefiniteSize`
Element Retrieval	`head, headOption, last, lastOption, xs find p`
Sub-collection	`xs.tail, xs.init, xs slice (from, to), xs take n, xs drop n, xs takeWhile p, xs dropWhile p, xs filter p, xs withFilter p, xs filterNot p`
Subdivision	`xs splitAt n, xs span p, xs partition p, xs groupBy f`
Element Condition	`xs forall p, xs exists p, xs count p`
Fold	`(z /:  xs)(op), (xs : z)(op), xs.foldLeft(z)(op), xs.foldRight(z)(op), xs reduceLeft op, xs reduceRight op`
Specific Fold	`xs.sum, xs.product, xs.min, xs.max`
String	`xs addString (b, start, sep, end), xs mkString (start, sep, end), xs.stringPrefix`
View	`xs.view, xs view (from, to)`

Reference: `http://docs.scala-lang.org/overviews/collections/trait-traversable.html`

2.3 Trait `Iterable`

All methods in this trait are defined in terms of an an abstract method, `iterator`, which yields the collections elements one by one.

Table 2: Methods in `Iterable`

Category	Methods
Abstract	`xs.iterator`
Iterator	`xs grouped n, xs sliding n`
Subcollection	`xs takeRight n, xs dropRight n`
Zipper	`xs zip ys, xs zipAll (ys, x, y), xs.zipWithIndex`
Comparison	`xs sameElements ys`

Reference: `http://docs.scala-lang.org/overviews/collections/trait-iterable.html`

In the inheritance hierarchy below `Iterable` you find three traits: `Seq`, `Set`, and `Map`. A common aspect of these three traits is that they all implement the `PartialFunction` trait with its `apply` and `isDefinedAt` methods. However, the way each trait implements `PartialFunction` differs.

2.4 Seq

All methods in this trait are defined in terms of an an abstract method, `iterator`, which yields the collections elements one by one.

Table 3: Methods in `Seq`

Category	Methods
Indexing and Length	`xs(i), xs isDefinedAt i, xs.length, xs.lengthCompare ys, xs.indices`
Index Search	`xs indexOf x, xs lastIndexOf x, xs indexOfSlice ys, xs lastIndexOfSlice ys, xs indexWhere p, xs segmentLength (p, i), xs prefixLength p`
Addition	`x +:  xs, xs :+ x, xs padTo (len, x)`
Update	`xs patch (i, ys, r), xs updated (i, x), xs(i) = x`(only available for `mutable.Seq`s)
Sorting	`xs.sorted, xs sortWith lt, xs sortBy f`
Reversal	`xs.reverse, xs.reverseIterator, xs reverseMap f`
Comparison	`xs startsWith ys, xs endsWith ys, xs contains x, xs containsSlice ys, (xs corresponds ys)(p)`
Multiset	`xs intersect ys, xs union ys, xs diff ys, xs.distinct`

Reference: `http://docs.scala-lang.org/overviews/collections/seqs.html`

Trait `Seq` has two subtraits `LinearSeq`, and `IndexedSeq`. These do not add any new operations, but each offers different performance characteristics: A linear sequence has efficient `head` and `tail` operations, whereas an indexed sequence has efficient `apply`, `length`, and (if mutable) `update` operations. Frequently used linear sequences are `immutable.List` and `immutable.Stream`. Frequently used indexed sequences are `scala.Array` and `mutable.ArrayBuffer`. The `Vector` class provides an interesting compromise between indexed and linear access. It has both effectively constant time indexing overhead and constant time linear access overhead. Because of this, vectors are a good foundation for mixed access patterns where both indexed and linear accesses are used.

Table 4: Methods in `Buffer`

Category	Methods
Addition	`buf += x, buf += (x, y, z), buf ++= xs, x +=:  buf, xs ++=:  buf, buf insert (i, x), buf insertAll (i, xs)`
Removal	`buf -= x, buf remove i, buf remove (i, n), buf trimStart n, buf trimEnd n, buf.clear()`
Cloning	`buf.clone`

2.5 Set

Table 5: Methods in `Set`

Category	Methods
Test	`xs contains x, xs(x), xs subsetOf ys`
Addition	`xs + x, xs + (x, y, z), xs ++ ys`
Removal	`xs - x, xs - (x, y, z), xs -- ys, xs.empty`
Set operation	`xs & ys, xs intersect ys, xs | ys, xs union ys, xs &  ys, xs diff ys`

Reference: `http://docs.scala-lang.org/overviews/collections/sets.html`

Mutable sets offer in addition methods to add, remove, or update elements, which are summarized in below.

Table 6: Methods in `mutable.Set`

Category	Methods
Addition	`xs += x, xs += (x, y, z), xs ++= ys, xs add x`
Removal	`xs -= x, xs -= (x, y, z), xs --= ys, xs remove x, xs retain p, xs.clear()`
Update	`xs(x) = b`
Cloning	`xs.clone`

2.6 Map

Table 7: Methods in `Map`

Category	Methods
Lookup	`ms get k, ms(k), ms getOrElse (k, d), ms contains k, ms isDefinedAt k`
Addition	`ms + (k -> v), ms + (k -> v, l -> w), ms ++ kvs`
Removal	`ms - k, ms - (k, 1, m), ms -- ks`
Update	`ms updated (k, v)`
Subcollection	`ms.keys, ms.keySet, ms.keyIterator, ms.values, ms.valuesIterator`
Transformation	`ms filterKeys p, ms mapValues f`

Reference: `http://docs.scala-lang.org/overviews/collections/maps.html`

Table 8: Methods in `mutable.Map`

Category	Methods
Addition	`ms += (k -> v), ms += (k -> v, l -> w), ms ++= kvs,`
Removal	`ms -= k, ms -= (k, l, m), ms --= ks, ms remove k, ms retain p, ms.clear()`
Update	`ms(k) = v, ms put (k, v), ms getOrElseUpdate (k, d)`
Transformation	`ms transform f`
Cloning	`xs.clone`