What is a seq?

# Anything that can be viewed as a list, regardless of its actual implementation.

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What makes a collection seq-able?

Supporting first, rest, cons, as described in clojure.lang. ISeq.

How can you get an actual seq from a seqable?

How do you move through a seq?

(seq coll)
(next aseq) ;; aka (seq (rest aseq))

Functions on collections result in ...

... seqs.

#### Where are custom seqs defined for most seqables?

### In an inner class of the collection. This leads to mangled

names like:

clojure.lang.SomeCollection\$Seg

How can maps be viewed as seqs?

The key/value pairs are the elements.

## How can you get a reliable order of traversal for maps and sets?

#### Use sorted sets and sorted maps.

(sorted-set & elements)

(sorted-map & elements)

Describe conj and into.

They are like cons and concat, but they add the elements in the position most efficient for the underlying representation.

```
(conj coll element & elements)
(into to-coll from-coll)
```

All Clojure sequences are ... and most are ...

... immutable ... lazy.

### What's an easy way to insert commas between words?

(interpose separator coll)
user=> (apply str (interpose ", " ["a" "b" "c"]))
"a, b, c"

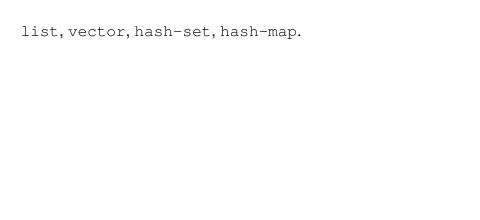
clojure.contrib.str-util's str-join wraps the common apply str pattern.

### What's the difference between set/vec and hash-set/vector?

vec and set take a single collection argument, hash-set

and vector take variable elements.

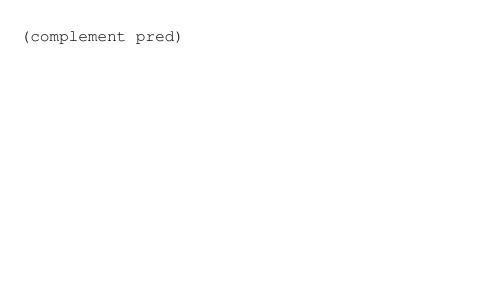
What are the common sequence factory methods that take a variable number of elements as arguments?



### What are the common sequence filtering functions?

(take-while pred coll)
(drop-while pred coll)
(split-at index coll)
(split-with pred coll)

How can you create a new predicate that reverses the truth conditions of an existing one?



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What are the common sequence predicates?

(every? pred coll)
(some pred coll)
(not-every? pred coll)
(not-any? pred coll)

What are the common sequence transforming functions?

```
(map f coll)
(reduce f val? coll)
(sort comp? coll)
(sort-by keyfn comp? coll) ; keyfn is for *getting* the keys
```

Give the signature for seq comprehensions.

How are they implemented?

(for [binding-form coll-expr filter-expr? ...] expr) There can be may binding-form/coll-expr pairs in a row.

Seq comprehensions are a macro.

## Which filter expressions are available for seq comprehensions?

- -: when expr which is much like a standard filter/guard.
- -: while expr which stops the comprehension as soon as the predicate fails.

Force the evaluation of a lazy sequence.

•	stores result of traversal and return doesn't store, returns nil	ıS

#### What can be treated as a seq, Clojure collections aside?

- Java collections, arrays, and strings
- RegexpsFile hierarchies
- Streams
- XML trees
- Database results

# Which structure-specific functions do lists support?

(peek coll)
(peek coll)

peek returns the first element, pop is like rest but throws an exception on an empty sequence.

# Which structure-specific functions do vectors support?

peek which returns the last element, and pop which returns the "init" of a vector.

```
(get vector index)
(vector index)
(subvec vector start end?)
```

#### What's the difference between take/drop and subvec?

take/drop work on any sequence, but subvec is much

faster for vectors.

# Which structure-specific functions do maps support for querying contents?

(keys map)
(vals map)
(get map key not-found?)
(a-map element); test for membership
(a-keyword map); test for membership

What's the trouble with looking up a key in a map?

How can you avoid this problem?

You can't know if a result of nil indicates they key was not in the map or if it was present, mapped to nil.

#### You can get around the problem with:

(contains? map key)
(get map key not-found?)

# What structure-specific functions do maps support for creating new maps?

(assoc map key val & more-kvs)
(dissoc map key & more-keys)
(select-keys map key-seq)
(merge map1 map2); map2 wins if both keys exist

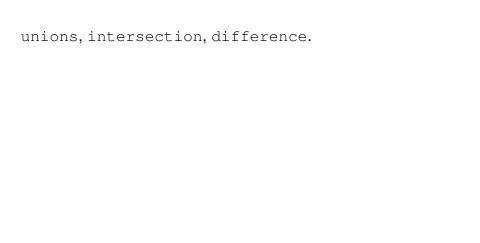
(merge-with merge-fn & maps)

### Unlike other structure-specific functions, those for sets must be ...

... imported to be used unqualified.

(use 'clojure.set)

# Which set-theoretic operations do sets support?



How can database results be viewed as seqable. There are two important correspondences between relational algebra, databases, and the clojure type system.

relation = table = set-like tuple = row = map-like

So in clojure you might have a set of maps (i.e., a relation).

# Which database-like functions does Clojure support?

#### Straight sets: (select pred set)

Relations (sets of maps):
(rename relation rename-map)
(project relation keys)
(join rel1 rel2 keymap?)