

# Clojure Cheat Sheet (Clojure 1.3, sheet v1.4)

## Documentation

clojure.repl/ doc find-doc apropos source pst javadoc  
(foo.bar/ is namespace for later syms)

## Primitives

### Numbers

Literals Long: 7 BigInt: 7N Ratio: -22/7 Double: 2.78  
BigDecimal: 4.2M

Arithmetic + - \* / quot rem mod inc dec max min

Compare = == not= < > <= >= compare

Bitwise bit-{and, or, xor, not, flip, set, shift-right,  
shift-left, and-not, clear, test}

Cast byte short int long float double bigdec bigint  
num rationalize biginteger

Test nil? identical? zero? pos? neg? even? odd?

Random rand rand-int

BigInt with-precision

Unchecked unchecked-{add, dec, divide, inc, multiply,  
negate, remainder, subtract}-int

### Strings

Create str format See also IO/to string

Use count get subs compare (clojure.string/) join escape  
split split-lines replace replace-first reverse  
(String) .indexOf .lastIndexOf

Regex #"pattern" re-find re-seq re-matches re-pattern  
re-matcher re-groups (clojure.string/) replace  
replace-first

Letters (clojure.string/) capitalize lower-case upper-case

Trim (clojure.string/) trim trim-newline triml trimr

Test char char? string? (clojure.string/) blank?

### Other

Characters char char-name-string char-escape-string

Keywords keyword keyword? find-keyword

Symbols symbol symbol? gensym

## Collections

### Collections

Generic ops count empty not-empty into conj

Content tests distinct? empty? every? not-every? some  
not-any?

Capabilities sequential? associative? sorted? counted?  
reversible?

Type tests coll? list? vector? set? map? seq?

### Lists

Create '() list list\*

Examine first nth peek .indexOf .lastIndexOf

'Change' cons conj rest pop

### Vectors

Create [] vector vec vector-of

Examine (my-vec idx) → ( nth my-vec idx) get peek  
.indexOf .lastIndexOf

'Change' assoc pop subvec replace conj rseq

### Sets

Create #{ } set hash-set sorted-set sorted-set-by

Examine (my-set item) → ( get my-set item) contains?

'Change' conj disj

Rel algebra (clojure.set/) join select project union  
difference intersection

Get map (clojure.set/) index rename-keys rename map-invert

Test (clojure.set/) subset? superset?

### Maps

Create {} hash-map array-map zipmap sorted-map  
sorted-map-by bean frequencies group-by

Examine (:key my-map) → ( get my-map :key) get-in  
contains? find keys vals

'Change' assoc assoc-in dissoc merge merge-with  
select-keys update-in

Entry key val

Sorted maps rseq subseq rsubseq

## Transients (clojure.org/transients)

Create transient persistent!

Change conj! pop! assoc! dissoc! disj! Note: always use re-  
turn value for later changes, never original!

## Misc

Compare = == identical? not= not compare

clojure.data/diff

Test true? false? nil? instance?

## Sequences

### Creating a Lazy Seq

From collection seq vals keys rseq subseq rsubseq

From producer fn lazy-seq repeatedly iterate

From constant repeat range

From other file-seq line-seq resultset-seq  
re-seq tree-seq xml-seq iterator-seq  
enumeration-seq

From seq keep keep-indexed

### Seq in, Seq out

Get shorter distinct filter remove for

Get longer cons conj concat lazy-cat mapcat cycle  
interleave interpose

Tail-items rest nthrest fnext nnext drop drop-while  
take-last for

Head-items take take-nth take-while butlast drop-last  
for

'Change' conj concat distinct flatten group-by  
partition partition-all partition-by split-at  
split-with filter remove replace shuffle

Rearrange reverse sort sort-by compare

Process items map pmap map-indexed mapcat for replace seque

### Using a Seq

Extract item first second last rest next ffirst nfirst  
fnext nnext nth nthnext rand-nth when-first  
max-key min-key

Construct coll zipmap into reduce reductions set vec  
into-array to-array-2d

Pass to fn apply

Search some filter

Force evaluation doseq dorun doall

Check for forced realized?

## Zippers (clojure.zip/)

Create zipper seq-zip vector-zip xml-zip

Get loc up down left right leftmost rightmost

Get seq lefts rights path children

'Change' make-node replace edit insert-child insert-left  
insert-right append-child remove

Move next prev

Misc root node branch? end?

## IO

to/from spit slurp (to writer/from reader, Socket, string with  
... file name, URI, etc.)

to \*out\* pr prn print printf println newline (clo-  
jure.pprint/) print-table

to writer (clojure.pprint/) pprint cl-format also: (binding  
[\*out\* writer] ...)

to string format with-out-str pr-str prn-str print-str  
println-str

from \*in\* read-line read

from reader line-seq read also: (binding [\*in\* reader] ...)  
java.io.Reader

from string read-string with-in-str

Open with-open (clojure.java.io/) text: reader writer  
binary: input-stream output-stream

Binary (.write ostream byte-arr) (.read  
istream byte-arr) java.io.OutputStream  
java.io.InputStream GitHub: gloss byte-spec

Misc flush (.close s) file-seq \*in\* \*out\* \*err\*  
(clojure.java.io/) file copy GitHub: fs

## Functions

Create	<code>fn defn defn- definline identity constantly memfn comp complement partial juxt memoize fn! every-pred some-fn</code>
Call	<code>-&gt; -&gt;&gt; apply</code>
Test	<code>fn? ifn?</code>

## Abstractions

### Protocols (clojure.org/protocols)

Define	<code>( defprotocol Slicey (slice [at]))</code>
Extend	<code>( extend-type String Slicey (slice [at] ...))</code>
Extend null	<code>( extend-type nil Slicey (slice [_] nil))</code>
Reify	<code>( reify Slicey (slice [at] ...))</code>

### Records (clojure.org/datatypes)

Define	<code>( defrecord Pair [h t])</code>
Access	<code>(:h (Pair. 1 2)) → 1</code>
Create	<code>Pair. -&gt;Pair map-&gt;Pair</code>

### Types (clojure.org/datatypes)

Define	<code>( deftype Pair [h t])</code>
Access	<code>(.h (Pair. 1 2)) → 1</code>
Create	<code>Pair. -&gt;Pair</code>
With methods	<code>( deftype Pair [h t] Object (toString [this] (str "&lt;" h ", " t "&gt;")))</code>

### Multimethods (clojure.org/multimethods)

Define	<code>( defmulti my-mm dispatch-fn)</code>
Method define	<code>( defmethod my-mm :dispatch-value [args] ...)</code>
Dispatch	<code>get-method methods</code>
Remove	<code>remove-method remove-all-methods</code>
Prefer	<code>prefer-method prefers</code>
Relation	<code>derive isa? parents ancestors descendants make-hierarchy</code>

## Macros

Create	<code>defmacro definline macroexpand-1 macroexpand</code>
Branch	<code>and or when when-not when-let when-first if-not if-let cond condp case</code>
Loop	<code>for doseq dotimes while</code>
Arrange	<code>.. doto -&gt;</code>
Scope	<code>binding locking time with-{in-str, local-vars, open, out-str, precision, redefs, redefs-fn}</code>
Lazy	<code>lazy-cat lazy-seq delay</code>
Doc.	<code>assert comment doc</code>

## Reader Macros

<code>'</code>	Quote 'form → (quote form)
<code>\</code>	Character literal
<code>;</code>	Single line comment
<code>^</code>	Metadata (see Metadata section)
<code>@</code>	Deref @form → (deref form)
<code>'</code>	Syntax-quote
<code>~</code>	Unquote
<code>~@</code>	Unquote-splicing
<code>#"p"</code>	Regex Pattern p
<code>#'</code>	Var quote #'x → (var x)
<code>#()</code>	#{...} → (fn [args] (...))
<code>#_</code>	Ignore next form

## Metadata (clojure.org/special\_forms)

General	<code>^{:key1 val1 :key2 val2 ...}</code>
Abbrevs	<code>^Type → ^{:tag Type}, ^:key → ^{:key true}</code>
Common	<code>^:dynamic ^:private ^:static ^:const</code>
Examples	<code>(defn ^:private ^:static ^String my-fn ...) (def ^:dynamic *dyn-var* val)</code>
On Vars	<code>meta with-meta vary-meta alter-meta! reset-meta! doc find-doc test</code>

## Special Forms (clojure.org/special\_forms)

<code>def if do let quote var fn loop recur throw try monitor-enter monitor-exit</code>	
Binding Forms /	(examples) <code>let fn defn defmacro loop for</code>
Destructuring	<code>doseq if-let when-let</code>

## Vars and global environment (clojure.org/vars)

Def variants	<code>def defn defn- definline defmacro defmethod defmulti defonce defrecord</code>
Interned vars	<code>declare intern binding find-var var</code>
Var objects	<code>with-local-vars var-get var-set alter-var-root var?</code>
Var validators	<code>set-validator! get-validator</code>

## Namespace

Current	<code>*ns*</code>
Create/Switch	<code>(tutorial) ns in-ns create-ns</code>
Add	<code>alias def import intern refer</code>
Find	<code>all-ns find-ns</code>
Examine	<code>ns-{name, aliases, map, interns, publics, refers, imports}</code>
From symbol	<code>resolve ns-resolve namespace</code>
Remove	<code>ns-unalias ns-unmap remove-ns</code>

## Loading

Load libs	<code>(tutorial) require use import refer</code>
List loaded	<code>loaded-libs</code>
Load misc	<code>load load-file load-reader load-string</code>

## Concurrency

Atoms	<code>atom swap! reset! compare-and-set!</code>
Futures	<code>future future-{call, done?, cancel, cancelled?} future?</code>
Threads	<code>bound-fn bound-fn* {get, push, pop}-thread-bindings thread-bound?</code>
Misc	<code>locking pcalls pvalues pmap seque promise deliver</code>

## Refs and Transactions (clojure.org/refs)

Create	<code>ref</code>
Examine	<code>deref @ (@form → (deref form))</code>
Transaction	<code>sync dosync io!</code>
In transaction	<code>ensure ref-set alter commute</code>
Validators	<code>set-validator! get-validator</code>
History	<code>ref-history-count ref-{min, max}-history</code>

## Agents and Asynchronous Actions (clojure.org/agents)

Create	<code>agent</code>
Examine	<code>agent-error</code>
Change state	<code>send send-off restart-agent</code>
Block waiting	<code>await await-for</code>
Ref validators	<code>set-validator! get-validator</code>
Watchers	<code>add-watch remove-watch</code>
Thread handling	<code>shutdown-agents</code>
Error	<code>error-handler set-error-handler! error-mode set-error-mode!</code>
Misc	<code>*agent* release-pending-sends</code>

## Java Interoperation (clojure.org/java\_interop)

General	.. doto Classname/ Classname. new bean comparator enumeration-seq import iterator-seq memfn set!
Cast	boolean byte short char int long float double bigdec bigint num cast biginteger
Exceptions	throw try catch finally pst

### Arrays

Create	make-array {object, boolean, byte, short, char, int, long, float, double}-array aclone to-array to-array-2d into-array
Use	aget aset aset-{boolean, byte, short, char, int, long, float, double} alength amap areduce
Cast	booleans bytes shorts chars ints longs floats doubles

### Proxy

Create	proxy get-proxy-class {construct, init}-proxy
Misc	proxy-mappings proxy-super update-proxy

### Other

XML	clojure.xml/parse xml-seq
REPL	*1 *2 *3 *e *print-dup* *print-length* *print-level* *print-meta* *print-readably*
Code	*compile-files* *compile-path* *file* *warn-on-reflection* compile gen-class gen-interface loaded-libs test
Misc	eval force hash name *clojure-version* clojure-version *command-line-args*