

# Clojure Cheat Sheet (Clojure 1.3.0, sheet v1.1)

## Documentation

clojure.repl   doc find-doc apropos source pst javadoc

## Primitives

### Numbers

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
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
Regex	#"pattern" re-find re-seq re-matches re-pattern re-matcher re-groups replace replace-first
Letters	(clojure.string) capitalize lower-case upper-case
Trim	(clojure.string) trim trim-newline triml trimr
Cast/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
'Change'	cons conj rest pop

### Vectors

Create	[] vector vec vector-of
Examine	(my-vec idx) → ( nth my-vec idx) get peek
'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
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

Create	transient persistent!
Change	conj! pop! assoc! dissoc! disj! Remember      to bind result to a symbol!

### 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 for
Head-items	take take-nth take-while take-last 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
Un-lazy Seq	sequence

### 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
Get zipper	seq-zip vector-zip xml-zip
Get location	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 also: (binding [*in* reader] ...) java.io.Reader
from string	read-string with-in-string
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*

## Special Forms

```
def if do let quote var fn loop recur throw try  
monitor-enter monitor-exit
```

## Functions

Create	fn defn defn- definline identity constantly memfn comp complement partial juxt memoize fnil every-pred some-fn
Call	-> -> apply
Test	fn? ifn?

## Abstractions (<http://clojure.org/protocols>)

### Protocols

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

### Records

Define	( defrecord Pair [h t])
Access	(:h (Pair. 1 2)) → 1
Create	Pair. ->Pair map->Pair

### Types

Define	( deftype Pair [h t])
Access	(.h (Pair. 1 2)) → 1
Create	Pair. ->Pair
With methods	( deftype Pair [h t] Object (toString [this] (str "<" h " " t ">)))

### Multimethods

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

## Macros

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

## Reader Macros

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

## Metadata

General	^{:key1 val1 :key2 val2 ...}
Abbrevs	^Type → ^{:tag Type}, ^:key → ^{:key true}
Common	^:dynamic ^:private ^:static
Example	(defn ^:private ^:static ^String my-fn ...) (def ^:dynamic *dyn-var* val)
Others	:added :author :arglists :doc :inline :inline-arities :macro
On Vars	meta with-meta vary-meta alter-meta! reset-meta! doc find-doc test

## Vars and global environment

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

## Namespace

Current	*ns*
Create/Switch	in-ns ns create-ns
Add	alias def import intern refer
Find	all-ns find-ns
Examine	ns-name ns-aliases ns-map ns-interns ns-publics ns-refers ns-imports
From symbol	resolve ns-resolve namespace
Remove	ns-unalias ns-unmap remove-ns

## Loading

Loading libs	require use import refer
Listing loaded libs	loaded-libs
Loading misc	load load-file load-reader load-string

## Concurrency

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

## Refs and Transactions

Create	ref
Examine	deref @ (@form → (deref form))
Transaction macros	sync dosync io!
In transaction	ensure ref-set alter commute
Validators	set-validator! get-validator
History	ref-history-count ref-max-history ref-min-history

## Agents and Asynchronous Actions

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

## Java Interoperation

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
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-proxy 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*