

Clojure Cheat Sheet (Clojure 1.3 - 1.6, sheet v19)

Documentation	
clojure.repl/	doc find-doc apropos source pst javadoc (foo.bar/ is namespace for later syms)
Primitives	
Numbers	
Literals	Long: 7, hex 0xff, oct 017, base 2 2r1011, base 36 36rCRAZY BigInt: 7N Ratio: -22/7 Double: 2.78 -1.2e-5 BigDecimal: 4.2M
Arithmetic	+ - * / quot rem mod inc dec max min +' -' *' inc' dec'
Compare	= == not= < > <= >= compare
Bitwise	bit-and bit-or bit-xor bit-not bit-flip bit-set bit-shift-right bit-shift-left bit-and-not bit-clear bit-test (1.6) unsigned-bit-shift-right (see BigInteger for integers larger than Long)
Cast	byte short int long float double bigdec bigint num rationalize biginteger
Test	zero? pos? neg? even? odd? number? rational? integer? ratio? decimal? float?
Random	rand rand-int
BigDecimal	with-precision
Unchecked	*unchecked-math* unchecked-add unchecked-dec unchecked-inc unchecked-multiply unchecked-negate unchecked-subtract
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 (1.5) re-quote-replacement (String) .indexOf .lastIndexOf
Regex	#"pattern" re-find re-seq re-matches re-pattern re-matcher re-groups (clojure.string/) replace replace-first (1.5) re-quote-replacement
Letters	(clojure.string/) capitalize lower-case upper-case
Trim	(clojure.string/) trim trim-newline triml trimr
Test	char char? string? (clojure.string/) blank? (String) .startsWith .endsWith .contains
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 (clojure.walk/) walk prewalk prewalk-demo prewalk-replace postwalk postwalk-demo postwalk-replace
Content tests	distinct? empty? every? not-every? some not-any?
Capabilities	sequential? associative? sorted? counted? reversible?
Type tests	coll? list? vector? set? map? seq? (1.6) record?
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
Ops	(1.4) mapv filterv reduce-kv
Sets	
Create	#{} set hash-set sorted-set sorted-set-by (flat-land.ordered.set/) ordered-set
Examine	(my-set item) → ( get my-set item) contains?
'Change'	conj disj
Set ops	(clojure.set/) union difference intersection select See also Relations
Test	(clojure.set/) subset? superset?
Maps	
Create	{ } hash-map array-map zipmap sorted-map sorted-map-by bean frequencies group-by (clojure.set/) index (flat-land.ordered.map/) ordered-map (clojure.data.priority-map/) priority-map (flatland.useful.map/) ordering-map
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 (clojure.set/) rename-keys map-invert GitHub: Medley
Entry	key val
Sorted maps	rseq subseq rsubseq

Relations (set of maps, each with same keys, aka rels)	
Rel algebra	(clojure.set/) join select project union difference intersection index rename
Transients (clojure.org/transients)	
Create	transient persistent!
Change	conj! pop! assoc! dissoc! disj! Note: always use return value for later changes, never original!
Misc	
Compare	= == identical? not= not compare clojure.data/diff
Test	true? false? instance? nil? (1.6) some?

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 take-nth for
Get longer	cons conj concat lazy-cat mapcat cycle interleave interpose
Tail-items	rest nthrest next fnext nnext drop drop-while take-last for
Head-items	take 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, URL, etc.)
to *out*	pr prn print printf println newline (clojure.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 (clojure.tools.reader.edn/) read
from reader	line-seq (clojure.tools.reader.edn/) read also: (binding [*in* reader] ...) java.io.Reader
from string	with-in-str (clojure.tools.reader.edn/) read-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* (clojure.java.io/) file copy delete-file resource as-file as-url as-relative-path GitHub: fs
Data readers	(1.4) *data-readers* default-data-readers (1.5) *default-data-reader-fn*

Functions	
Create	fn defn defn- definline identity constantly memfn comp complement partial juxt memoize fnil every-pred some-fn
Call	apply -> ->> trampoline (1.5) as-> cond-> cond->> some->>
Test	fn? ifn?

## Abstractions (Clojure type selection flowchart)

### Protocols (clojure.org/protocols)

Define	( defprotocol Slice ( slice [at]))
Extend	( extend-type String Slice ( slice [at] ...))
Extend null	( extend-type nil Slice ( slice [_] nil))
Reify	( reify Slice ( slice [at] ...))
Test	satisfies? extends?
Other	extend extend-protocol extenders

### Records (clojure.org/datatypes)

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

### Types (clojure.org/datatypes)

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

### Multimethods (clojure.org/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
Debug	macroexpand-1 macroexpand (clojure.walk/) macroexpand-all
Branch	and or when when-not when-let when-first if-not if-let
	cond condp case (1.6) when-some if-some
Loop	for doseq dotimes while
Arrange	.. doto -> ->> (1.5) as-> cond-> cond->> some-> some->>
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
Doc.	assert comment doc

## Reader Macros (clojure.org/reader)

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

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

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

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

def if do let letfn quote var fn loop recur throw try monitor-enter monitor-exit	
Binding Forms /	(examples) let fn defn defmacro loop for doseq
Destructuring	if-let when-let (1.6) if-some when-some

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

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?
	bound? thread-bound?
Var validators	set-validator! get-validator

## Namespace

Current	*ns*
Create/Switch	(tutorial) ns in-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 the-ns
Remove	ns-unalias ns-unmap remove-ns

## Loading

Load libs	(tutorial) require use import refer
List loaded	loaded-libs
Load 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 (clojure.org/refs)

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

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

Create	agent
Examine	agent-error
Change state	send send-off restart-agent (1.5)
	send-via set-agent-send-executor!
	set-agent-send-off-executor!
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 (clojure.org/java\_interop)

General	.. doto Classname/ Classname. new bean comparator
	enumeration-seq import iterator-seq memfn set! class
	class? bases supers type
Cast	boolean byte short char int long float double bigdec
	bigint num cast biginteger
Exceptions	throw try catch finally pst (1.4) ex-info ex-data

## Arrays

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

## Proxy (Clojure type selection flowchart)

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*
Browser	(clojure.java.browse/) browse-url (clojure.java.shell/) sh
/ Shell	with-sh-dir with-sh-env