

Clojure Cheat Sheet (Clojure 1.6 - 1.9, sheet v45)

Documentation

clojure.repl/ doc find-doc apropos dir 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 == < > <= >= 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
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? (1.9) double? int? nat-int?
neg-int? pos-int?

Random rand rand-int

BigDecimal with-precision

Unchecked *unchecked-math* unchecked-add unchecked-dec unchecked-inc
unchecked-multiply unchecked-negative unchecked-subtract

Strings

Create str format "a string" "escapes \b\f\n\t\r\" octal \377 hex \ucafe"
See also section IO/to string

Use count get subs compare (clojure.string/) join escape split split-lines
replace replace-first reverse (1.8) index-of last-index-of

Regex #"pattern" re-find re-seq re-matches re-pattern re-matcher re-groups
(clojure.string/) replace replace-first re-quote-replacement Note: \ in #" " is not escape char. (re-pattern "\\s*\\d+") can be written
#"\\s*\\d+"

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

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

Test string? (clojure.string/) blank? (1.8) starts-with? ends-with?
includes?

Other

Characters char char? char-name-string char-escape-string literals: \a
\newline (more at link)

Keywords keyword keyword? find-keyword literals: :kw :my.name.space/kw
::in-cur-namespace ::namespace-alias/kw

Symbols symbol symbol? gensym literals: my-sym my.ns/foo

Misc literals: true false nil

Collections

Collections

Generic ops count empty not-empty into conj (clojure.walk/) walk prewalk
prewalk-demo prewalk-replace postwalk postwalk-demo
postwalk-replace (1.9) bounded-count

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

Capabilities sequential? associative? sorted? counted? reversible?

Type tests coll? list? vector? set? map? seq? record? (1.8)
map-entry?

Lists (conj, pop, & peek at beginning)

Create () list list*

Examine first nth peek .indexOf .lastIndexOf

'Change' cons conj rest pop

Vectors (conj, pop, & peek at end)

Create [] vector vec vector-of mapv filterv (clojure.core.rrb-vector/) vector
vec vector-of

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

'Change' assoc assoc-in pop subvec replace conj rseq update-in (1.7) update
Ops reduce-kv

Sets

Create unsorted #{ } set hash-set

Create sorted sorted-set sorted-set-by (clojure.data.avl/) sorted-set
sorted-set-by (flatland.ordered.set/) ordered-set (clojure.data.int-
map/) int-set dense-int-set
(my-set item) → (get my-set item) contains?

Examine conj disj

'Change' (clojure.set/) union difference intersection select See also sec-
tion Relations

Set ops (clojure.set/) subset? superset?

Test sorted sets rseq subseq rsubseq

Maps

Create unsorted { } hash-map array-map zipmap bean frequencies group-by (clo-
jure.set/) index

Create sorted sorted-map sorted-map-by (clojure.data.avl/) sorted-map
sorted-map-by (flatland.ordered.map/) ordered-map
(clojure.data.priority-map/) priority-map (flatland.useful.map/) ordering-map
(clojure.data.int-map/) int-map
(my-map k) → (get my-map k) also (: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
(1.7) update (clojure.set/) rename-keys map-invert GitHub:
Medley

Ops reduce-kv

Entry key val

Sorted maps rseq subseq rsubseq

Queues (conj at end, peek & pop from beginning)

Create clojure.lang.PersistentQueue/EMPTY (no literal syntax or
constructor fn)

Examine peek

'Change' conj pop

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/reference/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? some?

Sequences

Creating a Lazy Seq

From collection seq vals keys rseq subseq rsubseq sequence

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
keep keep-indexed

Seq in, Seq out

Get shorter distinct filter remove take-nth for (1.7) dedupe random-sample

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
reverse sort sort-by compare

Rearrange 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
mapv filterv

Pass to fn apply

Search some filter

Force evaluation doseq dorun doall (1.7) run!

Check for forced realized?

Transducers (clojure.org/reference/transducers)

Off the shelf map mapcat filter remove take take-while take-nth drop
drop-while replace partition-by partition-all keep
keep-indexed map-indexed distinct interpose (1.7) cat
dedupe random-sample (1.9) halt-when

Create your own (1.7) completing ensure-reduced unreduced See also section Con-
currency/Volatiles

Use into sequence (1.7) transduce eduction

Early termination reduced reduced? deref

Spec (rationale, guide)

Operations valid? conform uniform explain explain-data explain-str
explain-out form describe assert check-asserts
check-asserts?

Generator ops gen exercise exercise-fn

Defn. & registry def fdef registry get-spec spec? spec with-gen

Logical and or

Collection coll-of map-of every every-kv keys merge

Regex cat alt * + ? & keys*

Range int-in inst-in double-in int-in-range? inst-in-range?

Other nilable multi-spec fspec conformer

Custom explain explain-printer *explain-out*

Predicates with test.check generators

Numbers number? rational? integer? ratio? decimal? float? zero?
(1.9) double? int? nat-int? neg-int? pos-int?

Symbols, keyword? symbol? (1.9) ident? qualified-ident?

keywords qualified-keyword? qualified-symbol? simple-ident?
simple-keyword? simple-symbol?

Other string? true? false? nil? some? (1.9) boolean? bytes?

scalars inst? uri? uuid?

Collections list? map? set? vector? associative? coll? sequential?
seq? empty? (1.9) indexed? seqable?

Other (1.9) any?

IO

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

... to *out* pr prn print printf println newline (clojure.pprint/) print-table
(clojure.pprint/) pprint cl-format also: (binding [*out* writer]
...)

to string from *in* format with-out-str pr-str prn-str print-str println-str
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 *data-readers* default-data-readers *default-data-reader-fn*

Functions

Create fn defn defn- definline identity constantly memfn comp complement
partial juxt memoize fnl every-pred some-fn

Call apply -> ->> trampoline as-> cond-> cond->> some-> some->>

Test fn? ifn?

Abstractions (Clojure type selection flowchart)	
Protocols (clojure.org/reference/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] ...))
Test	satisfies? extends?
Other	extend extend-protocol extenders
Records (clojure.org/reference/datatypes)	
Define	(defrecord Pair [h t])
Access	(.h (Pair. 1 2)) → 1
Create	Pair. ->Pair map->Pair
Test	record?
Types (clojure.org/reference/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/reference/multimethods)	
Define	(default multi 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 underive 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 when-some if-some
Loop	for doseq dotimes while
Arrange	.. doto -> ->> 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

Special Characters (clojure.org/reference/reader, guide)	
,	Comma reads as white space. Often used between map key/value pairs for readability.
'	quote: 'form → (quote form)
/	Namespace separator (see Primitives/Other section)
\	Character literal (see Primitives/Other section)
:	Keyword (see Primitives/Other section)
;	Single line comment
~	Metadata (see Metadata section)
foo	'earmuffs' - convention to indicate dynamic vars, compiler warns if not dynamic
@	Deref: @form → (deref form)
'	Syntax-quote
foo#	'auto-gensym', consistently replaced with same auto-generated symbol everywhere inside same '(...)
-	Unquote
~@	Unquote-splicing
->	'thread first' macro ->
->>	'thread last' macro ->>
>!! <!! >! <!	core.async channel macros >!! <!! >! <!
(List literal (see Collections/Lists section)
[Vector literal (see Collections/Vectors section)
{	Map literal (see Collections/Maps section)
{'	Var-quote #'x → (var x)
#"	#"p" reads as regex pattern p (see Strings/Regex section)
#{	Set literal (see Collections/Sets section)
#{(Anonymous function literal: #(...) → (fn [args] (...))
%	Anonymous function argument: %N is value of anonymous function arg N. % short for %1. %k for rest args.
##?	(1.7) Reader conditional: #{:(clj x :cljs y) reads as x on JVM, y in ClojureScript, nothing elsewhere. Other keys: :cljr :default
##?@	(1.7) Splicing reader conditional: [1 ##?@:(clj [x y] :cljs [w z]) 3] reads as [1 x y 3] on JVM, [1 w z 3] in ClojureScript, [1 3] elsewhere.
#foo	tagged literal e.g. #inst #uuid
#:	map namespace syntax e.g. #:foo{:a 1 :b 2} is equal to {:foo/a 1 :foo/b 2}
##	(1.9) symbolic values: ##Inf ##-Inf ##NaN
\$	JavaContainerClass\$InnerClass
foo?	conventional ending for a predicate, e.g.: zero? vector?
	instance? (unenforced)
foo!	conventional ending for an unsafe operation, e.g.: set! swap! alter-meta! (unenforced)
-	conventional name for an unused value (unenforced)
_	Ignore next form

Metadata (clojure.org/reference/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/reference/special_forms)	
def if do let letfn quote var fn loop recur set!	throw try monitor-enter monitor-exit
Binding Forms /	(examples) let fn defn defmacro loop for doseq if-let
Destructuring	when-let if-some when-some

Vars and global environment (clojure.org/reference/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! (1.9) swap-vals! reset-vals!
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?
Volatiles	(1.7) volatile! vreset! vswap! volatile?
Misc	locking pcalls pvalues pmap seque promise deliver

Refs and Transactions (clojure.org/reference/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/reference/agents)	
Create	agent
Examine	agent-error
Change state	send send-off restart-agent 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/reference/java_interop)	
General	.. doto Classname/ Classname. new bean comparator enumeration-seq import iterator-seq memfn set! class class? bases supers type gen-class gen-interface definterface
Cast	boolean byte short char int long float double bigdec bigint num cast biginteger
Exceptions	throw try catch finally pst ex-info ex-data (1.9) StackTraceElement->vec

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

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?

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 loaded-libs test
Misc	eval force hash name *clojure-version* clojure-version *command-line-args*
Browser / Shell	(clojure.java.browse/) browse-url (clojure.java.shell/) sh with-sh-dir with-sh-env