Clojure Cheat Sheet (Clojure 1.3 - 1.6, sheet v28)

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 (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 "a string" "escapes \b\f\n\t\r\" octal \377 hex \ucafe"` 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 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	`char char? string? (clojure.string/) blank? (String) .startsWith .endsWith .contains`

Other

Characters	`char char-name-string char-escape-string literals: \a \newline (more at link)`
Keywords	`keyword keyword? find-keyword literals: :kw :my.ns/kw ::in-cur-ns`
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`
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 (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 (1.4) mapv filterv`
Examine	`(my-vec idx)` → `( nth my-vec idx) get peek .indexOf .lastIndexOf`
'Change'	`assoc pop subvec replace conj rseq`
Ops	`(1.4) reduce-kv`

Sets

Create unsorted	`#{} set hash-set (clojure.data.int-map/) int-set dense-int-set`
Create sorted	`sorted-set sorted-set-by (clojure.data.avl/) sorted-set sorted-set-by (flatland.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?`
Sorted sets	`rseq subseq rsubseq`

Maps

Create unsorted	`{} hash-map array-map zipmap bean frequencies group-by (clojure.set/) index (clojure.data.int-map/) int-map`
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`
Examine	`(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 (clojure.set/) rename-keys map-invert GitHub: Medley`
Ops	`(1.4) 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/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 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`
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 (1.4) mapv filterv`
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 (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-> some->>`
Test	`fn? ifn?`

Abstractions (Clojure type selection flowchart)

Protocols (clojure.org/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/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`

With methods	`( deftype Pair [h t]`
	`  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 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` (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`

Special Characters (clojure.org/reader, tutorial)

`,`	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`
`~`	`Unquote`
`~@`	`Unquote-splicing`
`->`	`'thread first' macro ->`
`->>`	`'thread last' macro ->>`
`(`	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. %& for rest args.`
`$`	`JavaContainerClass$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/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 set!  throw try monitor-enter monitor-exit`

Binding Forms / Destructuring	`(examples) let fn defn defmacro loop for doseq 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 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 (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 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`