Clojure Cheat Sheet (Clojure 1.4 - 1.7, sheet v27)

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 section 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 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 mapv filterv`
Examine	`(my-vec idx)` → `( nth my-vec idx) get peek .indexOf .lastIndexOf`
'Change'	`assoc pop subvec replace conj rseq update-in (1.7) update`
Ops	`reduce-kv`

Sets

Create	`#{} set hash-set 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 section Relations
Test	(clojure.set/) `subset? superset?`
Sorted sets	`rseq subseq rsubseq`

Maps

Create	`{} hash-map array-map zipmap sorted-map sorted-map-by bean frequencies group-by` (clojure.set/) `index` (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 (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/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 mapv filterv`
Pass to fn	`apply`
Search	`some filter`
Force evaluation	`doseq dorun doall (1.7) run!`
Check for forced	`realized?`

Transducers (clojure.org/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`
Create your own	`(1.7) completing ensure-reduced unreduced` See also section Concurrency/Volatiles
Use	`into sequence (1.7) transduce eduction`
Early termination	`reduced reduced? deref`

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	`*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

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 *p* (see Strings/Regex section)
#′	Var-quote #′x → (var x)
#()	Anonymous function literal: #(...) → (fn [args] (...))
#_	Ignore next form
#?	(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.

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?
Volatiles	(1.7) volatile! vreset! vswap! volatile?
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 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