Clojure Cheat Sheet (Clojure 1.3 & 1.4, sheet v8)

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`
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 biginteger`
Test	`nil? identical? zero? pos? neg? even? odd?`
Random	`rand rand-int`
BigDecimal	`with-precision`
Unchecked	`*unchecked-math* 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 (String) .indexOf .lastIndexOf`
Regex	`#"pattern" re-find re-seq re-matches re-pattern re-matcher re-groups` (clojure.string/) `replace replace-first`
Letters	(clojure.string/) `capitalize lower-case upper-case`
Trim	(clojure.string/) `trim trim-newline triml trimr`
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`
Data readers	`(1.4) *data-readers* default-data-readers`

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?`

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`
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 group-by`
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 (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? 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 take-nth for`
Get longer	`cons conj concat lazy-cat mapcat cycle interleave interpose`
Tail-items	`rest nthrest 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, 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`

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

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] ...))

Records (clojure.org/datatypes)

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

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 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
Loop	for doseq dotimes while
Arrange	.. doto ->
Scope	binding locking time with-{in-str, local-vars, open, out-str, precision, redefs, redefs-fn}
Lazy	lazy-cat lazy-seq delay
Doc.	assert comment doc

Reader Macros

'	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*
#'	Var quote #'x → (var x)
#()	#(...) → (fn [args] (...))
#_	Ignore next form

Metadata (clojure.org/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 quote var fn loop recur throw try monitor-enter monitor-exit

Binding Forms / Destructuring	(examples) let fn defn defmacro loop for doseq if-let when-let

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?
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, aliases, map, interns, publics, refers, imports}
From symbol	resolve ns-resolve namespace
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, done?, cancel, cancelled?} future?
Threads	bound-fn bound-fn* {get, push, 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, max}-history

Agents and Asynchronous Actions (clojure.org/agents)

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 (clojure.org/java_interop)

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 biginteger
Exceptions	throw try catch finally pst (1.4) ex-info ex-data

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