

Clojure Cheat Sheet (Clojure 1.3 - 1.5, sheet v12)

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 zero? pos? neg? even? odd? number? rational? integer? ratio? decimal? float?
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 (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 (clojure.string/) capitalize lower-case upper-case (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

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 (: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 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, 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 -> ->> (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] ...))
```

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
            ( 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
Loop        for doseq dotimes while
Arrange     .. doto -> ->> (1.5) as-> cond-> cond->> some->
            some->>
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 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
```

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, 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 (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!
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 (Clojure type selection flowchart)

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