Clojure Functional Lisp on the JVM

CONCEPTS

Code is data: everything is (function arg ...). Collections are immutable, so assoc and conj return new values.

Source form (+ 1 2)
↓ read
Data structure list of symbols
↓ compile
JVM bytecode on the fly
↓ run
Value 3

COMMAND LINE

clj
Start a REPL with line editing (rlwrap)

clojure
Run without rlwrap, for scripts and pipes

clojure -M -m *<ns>*
Run the -main function of a namespace

clojure -M *<file.clj>*
Run a script file

clojure -M:*<alias>*
Run with a deps.edn alias

clojure -X *<ns>*/*<fn>* **:k v**
Call a function with a map of args

REPL

(doc *<name>***)**
Show docs for a name

(source *<name>***)**
Print the source of a function

(require '[*<ns>* **:as** *<a>***] :reload)**
Load a namespace, re-reading its file

BASICS

(def x 1)
Define a var in the namespace

(defn f "doc" [a & more] ...)
Function with docstring and rest args

(fn [x] ...) / #(* % 2)
Anonymous function, short form

(let [a 1 b (+ a 1)] ...)
Local bindings, sequential

(if *<t>* *<a>* *<b>***) / (when** *<t>* **...)**
Conditional / one-armed with body

COLLECTIONS

[1 2 3] / '(1 2 3)
Vector / list literal

{:a 1 :b 2}
Map literal

#{1 2 3}
Set literal

(conj coll x)
Add: end of vector, front of list

(assoc m :k v)
Add or replace a key (or vector index)

(get m :k *<default>***) / (:k m)**
Look up a key

(update m :k inc)
Apply a function to a value

SEQUENCES

(map f xs)
Apply f to each item, lazily

(filter pred xs) / (remove pred xs)
Keep / drop matching items

(reduce f init xs)
Fold into one value

FUNCTIONS & MACROS

(→ x (f a) (g b))
Thread x as first argument

(→» xs (map f) (filter p))
Thread as last argument

(fn [{:keys [a b]}] ...)
Destructure a map argument

(let [[a b & r] xs] ...)
Destructure a sequence

STATE & CONCURRENCY

(swap! a f args)
Atomically update with f

NAMESPACES & JAVA

(ns *<name>* **(:require [***<lib>* **:as** *<a>***]))**
Declare a namespace and its deps

(require '[clojure.string :as str])
Load a library with an alias