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

***1 / *2 / *e**
Last results / last exception

(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

BASICS (cont.)

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

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

(cond <*t1*> <*a*> **:else** <*b*>**)**
Multi-way conditional

(loop [i 0] (recur (inc i)))
Loop with explicit recur

(doseq [x xs] ...)
Loop for side effects

(for [x xs :when (odd? x)] ...)
Lazy list comprehension

(str "a" 1 :b)
Concatenate as strings

(println ...) / (prn ...)
Print for humans / as readable data

(try ... (catch Exception e ...) (finally ...))
Handle errors

(nil? x) / (some? x)
Nil tests

(= a b) / (not= a b)
Value equality

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)

(dissoc m :k)
Remove a key

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

(get-in m [:a :b])
Look up a nested path

(assoc-in m [:a :b] v)
Set a nested path

COLLECTIONS (cont.)

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

(update-in m [:a :b] f)
Apply a function at a nested path

(merge m1 m2)
Combine maps, later wins

(keys m) / (vals m)
Keys / values of a map

(count c) / (empty? c)
Size / emptiness

(into [] xs)
Pour a sequence into a collection

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

(first xs) / (rest xs)
Head / tail

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