Elixir Functional language on BEAM

CONCEPTS

Everything is an expression and data is immutable: functions return new values, and = matches rather than assigns.

Source .ex / .exs
↓ elixirc / mix
Bytecode .beam files
↓ loads into
BEAM VM lightweight processes
↓ message passing
Supervision restart on crash

Files ending in .ex are compiled; .exs are scripts run as-is (tests, config, one-offs).

Mix (see the mix sheet) builds projects; Erlang tooling such as rebar3 covers Erlang dependencies.

RUN & COMPILE

iex
Start the interactive shell

iex -S mix
Shell with the project compiled and loaded

elixir *<file.exs>*
Run a script file

elixir -e "*<code>***"**
Evaluate one expression

elixir --version
Show Elixir and OTP versions

iex --sname *<name>* **--remsh** *<node>*
Attach to a running node

IEX HELPERS

h *<Module.fun/arity>*
Show docs for a function

i *<term>*
Inspect type and details of a value

recompile
Recompile the Mix project

Ctrl+C Ctrl+C
Quit the shell

dbg(*<expr>***)**
Print expression with pipeline steps

DATA & PATTERN MATCHING

{:ok, v} = *<expr>*
Match a tuple, bind v

[h | t] = *<list>*
Split head and tail

%{key: v} = *<map>*
Pull a value out of a map

^x = *<expr>*
Pin: match against existing x

%{m | key: v}
Update an existing key

<> and ++
Concatenate binaries / lists

%MyStruct{field: v}
Build or match a struct

CONTROL FLOW

x ▷ f() ▷ g(a)
Pipe result as first argument

case *<expr>* **do pattern -> ... end**
Branch on patterns

if *<c>* **do ... else ... end**
Plain conditional

with {:ok, a} ← f(), {:ok, b} ← g(a) do ... end
Chain matches, bail on first miss

for x ← *<list>*, *<filter>*, **do:** *<expr>*
Comprehension

when is_integer(x)
Guard on a clause

fn x → x + 1 end
Anonymous function

&(&1 + 1)
Capture shorthand

&Mod.fun/2
Capture a named function

MODULES & FUNCTIONS

defmodule *<Name>* **do ... end**
Define a module

def *<name>***(***<args>***) do ... end**
Public function

defp *<name>***(***<args>***)**
Private function

MODULES & FUNCTIONS (cont.)

def f(0), do: 1
One-line clause with pattern

@doc "*<text>***"**
Document the next function

@spec f(integer) :: atom
Declare a typespec

alias A.B.C, as: D
Shorten a module name

defstruct [:a, b: 0]
Declare a struct

STANDARD LIBRARY

Enum.map(*<en>***, fn x → ... end)**
Transform each element

Enum.filter(*<en>***, &pred/1)**
Keep matching elements

Enum.reduce(*<en>***,** *<acc>***, fn x, acc → ... end)**
Fold into one value

Map.get(*<map>***, :k,** *<default>***)**
Read with fallback

Map.put(*<map>***, :k, v)**
Set a key

String.split(*<s>***, ",")**
Split a string

File.read!(*<path>***)**
Read file or raise

IO.puts(*<s>***)**
Print a line

IO.inspect(*<v>***, label: "***<x>***")**
Print any value, returns it

Task.async(fn → ... end) ▷ Task.await()
Run work concurrently

TESTING & DOCS

mix test
Run all tests

use ExUnit.Case
Make a module a test case

test "*<name>***" do ... end**
Define a test

assert *<expr>*
Fail unless truthy