Elm Friendly functional frontend

CONCEPTS

Read compiler errors top to bottom: they usually name the fix.

Model all state
↓ view
View Html Msg
↓ user event
Msg what happened
↓ update
Update returns new Model
The Elm Architecture

Maybe and Result make failure explicit, so normal Elm code has no runtime exceptions.

Install the tools with npm: npm install -g elm elm-format elm-test.

PROJECT

elm init
Create elm.json and src/

elm install *<author/package>*
Add a dependency

elm repl
Start an interactive session

BUILD

elm make src/Main.elm
Compile to index.html

elm make src/Main.elm --output=elm.js
Compile to a JS file

elm make src/Main.elm --optimize
Optimized build, no Debug

elm make src/Main.elm --debug
Add the time-travel debugger

elm make src/Main.elm --output=/dev/null
Type-check only, no output

elm reactor
Serve the project at :8000

PACKAGES

elm publish
Publish a package version

elm bump
Compute the next version

PACKAGES (cont.)

elm diff
API changes since last publish

elm install elm/json
JSON encode and decode

elm install elm/http
HTTP requests

elm install elm/browser
Browser.element and Browser.application

TOOLING

elm-format src/ --yes
Format all files in place

elm-format src/ --validate
Fail if not formatted (CI)

elm-test init
Create tests/ and test deps

elm-test
Run all tests in tests/

elm-test *<file>*
Run one test file

elm-test --watch
Re-run on change

SYNTAX

module Main exposing (main)
Module header

import Html exposing (Html, div, text)
Import names

import Html.Attributes as A
Import with alias

name : Int → String
Type annotation

type alias User = { name : String }
Name a record type

type Msg = Inc | Dec
Custom type

case x of ... → ...
Pattern match

if a then b else c
Conditional, always an expression

let y = 1 in y + 1
Local bindings

\x → x + 1
Anonymous function

SYNTAX (cont.)

{ model | count = 1 }
Update record fields

model.count / .count
Field access / accessor function

x ▷ f ▷ g
Pipe left to right

CORE LIBRARY

List.map f xs
Transform each item

List.filter f xs
Keep matching items

List.foldl f init xs
Reduce a list

String.fromInt n / String.toInt s
Int to string / parse (Maybe)

Maybe.withDefault 0 m
Unwrap Maybe with fallback

Maybe.map f m
Apply inside Maybe

Result.map f r
Apply inside Result

Dict.fromList pairs
Build a Dict

Dict.get key d
Lookup, returns Maybe

Debug.log "label" value
Print and return value

PROGRAMS

Browser.sandbox
Simple app: init, view, update

Browser.element
App with Cmd, Sub and flags

Browser.application
Full app with URL routing

Cmd.none / Sub.none
No effect / no subscription

Http.get { url = u, expect = e }
GET request as a Cmd

Decode.field "name" Decode.string
JSON decoder for a field

Html.Events.onClick Msg
Send a Msg on click

Html.Events.onInput Msg
Send a Msg on typing