Crystal Compiled, Ruby-like language

CONCEPTS

Crystal is compiled (via LLVM) with Ruby-like syntax and static types that are mostly inferred. There is no interpreter: run compiles to a cached temp binary each time.

Write src/app.cr
↓ `shards install`
Deps lib/ + shard.lock
↓ `crystal build`
Build bin/app
↓ `crystal spec`
Test spec/*_spec.cr

Plain build is fast but unoptimized (-O0). Benchmark and ship with --release; it is much slower to compile.

RUN AND BUILD

`crystal run <file.cr>`
Compile and run a file

`crystal run <file.cr> -- <args>`
Pass arguments to the program

`crystal <file.cr>`
Shorthand for run

`crystal build <file.cr>`
Build a binary in the current dir

RUN AND BUILD (cont.)

`crystal build --release <file.cr>`
Optimized build (-O3, single module)

`crystal build -o <path> <file.cr>`
Choose the output path

`crystal build --no-debug <file.cr>`
Omit debug symbols

`crystal build --static <file.cr>`
Link statically

EVAL AND PLAYGROUND

`crystal eval '<code>'`
Compile and run a code string

`crystal version`
Print Crystal, LLVM and target triple

PROJECTS

`crystal init app <name>`
Scaffold an application

`crystal init lib <name>`
Scaffold a library

init creates src/, spec/ and shard.yml. Commit shard.lock for applications, leave it out for libraries.

PROJECTS (cont.)

`shards init`
Create a shard.yml

SPECS

`crystal spec`
Run all specs in spec/

`crystal spec <file>`
Run one spec file

`crystal spec <file>:<line>`
Run the example at a line

`crystal spec -e '<name>'`
Run examples matching a name

`crystal spec --tag <tag>`
Run examples with a tag

`crystal spec --fail-fast`
Stop at the first failure

FORMAT AND TOOLS

`crystal tool format`
Format all files in place

`crystal tool format <path>`
Format a file or folder

`crystal tool format --check`
Fail if anything is unformatted (CI)

`crystal docs`
Generate API docs into ./docs

SHARDS

`shards install`
Install deps into lib/ per the lock

`shards update`
Re-resolve all deps, rewrite shard.lock

`shards build`
Install deps, build into bin/

`shards build <target>`
Build one named target

`shards list`
Show installed versions

`shards install --production`
Locked only, no dev deps, fail if out of sync

shard.yml

```
name: myapp
version: 0.1.0
targets:
  myapp:
    main: src/myapp.cr
dependencies:
  kemal:
    github: kemalcr/kemal
    version: ~> 1.6
development_dependencies:
  ameba:
    github: crystal-ameba/ameba
```

Add a dependency to shard.yml by hand, then run shards install; there is no shards add command. Then require it by shard name.

LANGUAGE BASICS

Types and methods

```
name = "Ada"
age : Int32 = 36
def greet(who : String) : String
  "Hi, #{who}"
end
puts greet(name)
```

Classes and structs

```
class User
  property name : String
  getter id : Int32
  def initialize(@name, @id); end
end
struct Point
  getter x : Int32, y : Int32
  def initialize(@x, @y); end
end
```

Nil safety

```
# x is String?
x = ENV["HOME"]?
if x
  puts x.size
end
x.try &.size
x.not_nil!
```

`require "./file"` / `require "json"`
Load a relative file or stdlib module

Type? means Type | Nil. The compiler rejects calls on a possible nil; narrow with if, try, or not_nil! (raises at runtime).