crossword Reference Manual

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1 What it is

This manual is for the `crossword` command installed from the public release. You do not need the source tree. The command asks a local Ollama model for question-and-answer pairs about a topic, places the answers on a square crossword, and writes a PDF.

The PDF has three parts:

- a blank grid with a number in the corner of each word start;
- Across clues, then Down clues;
- an answer key with the same numbers and the letters filled in.

Each page footer reads: AI Crossword Puzzle Generator, Domino Data Systems by Shyamal Suhana Chandra, Copyright (C) 2026.

2 Requirements

- ARM64 macOS. Release v0.1.0 does not install on Intel Macs.
- The `crossword` binary from the Homebrew tap below.
- The Ollama macOS app left running in the menu bar. That app is the local server at `http://127.0.0.1:11434`.
- The model you pass with `--model` already pulled. These instructions use `gpt-oss:20b`. If you omit `--model`, the command uses `llama3.2`.

Check the server and the model before a long run:

```
curl -sS http://127.0.0.1:11434/api/tags
```

3 Install with Homebrew

Release v0.1.0 is only for ARM64 on macOS. Homebrew will not load the public tap until it is trusted. The tap name is:

```
Domino-Data-Systems/crossword
```

If `brew` is not installed yet, run Homebrew's install script, then put it on your PATH:

```
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/
    install.sh)"
echo >> ~/.zprofile
echo 'eval "$(/opt/homebrew/bin/brew shellenv)"' >> ~/.zprofile
eval "$(/opt/homebrew/bin/brew shellenv)"
```

Trust the tap, tap it, and install the formula. The formula downloads the public release and installs both the `crossword` binary and its manual page.

```
brew trust --tap Domino-Data-Systems/crossword
brew tap Domino-Data-Systems/crossword
brew install crossword
man crossword
```

The published install commands use the model `gpt-oss:20b`. Pull it while the Ollama menu-bar app is running, and pass it on the command line. The program default remains `llama3.2` when `--model` is omitted.

```
ollama pull gpt-oss:20b
crossword --topic "the solar system" --model gpt-oss:20b --verbose
```

After install, the command is on your PATH:

```
crossword --help
```

4 Synopsis

```
crossword --topic <TEXT>
          [--size <N>]
          [--output <PATH>]
          [--model <NAME>]
          [--host <URL>]
          [--candidates <N>]
          [--seed <U64>]
          [--verbose]
```

`--topic` is required. Every other flag has a default, except `--seed` and `--verbose`. Short flags exist for topic (`-t`), size (`-s`), output (`-o`), and verbose (`-v`).

Help text from the binary:

```
crossword --help
```

5 Arguments

Flag	Default	Meaning
`-t`, `--topic`	required	Topic the questions and answers should cover. An empty string is an error.
`-s`, `--size`	`25`	Side length of the square grid. Must be an integer from 5 through 40.
`-o`, `--output`	`crossword.pdf`	Path of the PDF to write. Parent directories must already exist.
`--model`	`llama3.2`	Ollama model name, including a tag if you use one, such as `llama3.2:latest`.
`--host`	`http://127.0.0.1:11434`	Base URL of the Ollama server. The client calls `/api/chat` and, when a model is missing, `/api/tags`.
`--candidates`	`80`	How many usable question-and-answer pairs to collect. Requests are sent 8 entries at a time.
`--seed`	current time	64-bit seed for shuffling words before placement. Printed on success so the run can be repeated.
`-v`, `--verbose`	off	Show progress on standard error: entries received, then words placed.

6 How to run

Minimal run with the model from these instructions. The PDF is `crossword.pdf` in the current directory, on a 25 by 25 grid:

```
crossword --topic "the solar system" --model gpt-oss:20b
```

A larger themed puzzle with progress:

```
crossword \
  --topic "Billy Joel" \
  --size 30 \
  --output "$HOME/Downloads/Billy-Joel-puzzle.pdf" \
  --model gpt-oss:20b \
  --candidates 300 \
  --verbose
```

Repeat a placement. Use the seed printed by the earlier run. A new Ollama call can return different words, so the grid matches only when the accepted answers match.

```
crossword \
  --topic "the solar system" \
  --model gpt-oss:20b \
  --seed 1 \
  --output solar.pdf
```

7 What a successful run prints

Standard error ends with one line of this form:

```
wrote crossword.pdf (25x25, 40 words, seed 12345)
```

The word count is the number of Across entries plus the number of Down entries. With `--verbose`, a progress bar precedes that line.

8 Candidate and grid rules

- Each answer must be one word of ASCII letters. Spaces, hyphens, and digits are rejected.
- Length is at least 3 and at most $\min(12, \mathit{size})$.
- The clue is a short question. If the model omits the question mark, one is added.
- A clue that contains the answer as a whole word is dropped.
- The first word is placed across the middle row.
- Every later word must cross an existing letter.
- The program exits with an error if fewer than eight words can be placed.

9 PDF pages

1. Blank puzzle titled "Crossword: *topic*".
2. One or more pages of clues, Across then Down. A clue looks like `12.  What is the capital of France?`
3. Answer key titled "Answer key: *topic*", with letters in the white squares.

10 Errors

The program writes `error:` and a reason to standard error, then exits with status 1.

Situation	What you see
Size outside 5–40	`size must be from 5 to 40`
Blank topic	`topic must not be empty`
Ollama not running	`could not connect to Ollama at` the chat URL
Model name not installed	Ollama's not-found message, plus a similar installed name when one is close
A batch exceeds three minutes	`timed out waiting for Ollama at` the chat URL. If some entries were already collected, the run continues with those.
No usable pairs	`Ollama returned no usable question and answer pairs`
Too few crossings	`only placed N words; try again or pick a broader topic`
Output path cannot be created	`could not create` the path