AI Crossword Puzzle Generator

From a topic to a printable grid

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What the tool does

- The installed command `crossword`. No source checkout.
- Input is a topic, such as “Billy Joel” or “the solar system”.
- A local Ollama model writes short questions and one-word answers.
- The program places those answers on a square crossword.
- Output is a PDF: blank puzzle, clues, and answer key.

Why local

- The topic never has to leave the machine.
- The default server is `http://127.0.0.1:11434`.
- The macOS app stays in the menu bar. That icon is the local daemon.
- These instructions pull `gpt-oss:20b` and pass `--model gpt-oss:20b`.
- Omitting `--model` selects `llama3.2`.
- If the model name is off by a few characters, the error names a similar installed model.

How a run proceeds

1. Ask Ollama for question-and-answer pairs, eight at a time.
2. Keep answers that are unique A–Z words of length 3 to 12.
3. Drop a clue that contains its own answer.
4. Place the longest word across the center.
5. Add later words only where they cross an existing letter.
6. Write the PDF and print the seed.

Grid rules

- Square grid, default 25×25, allowed range 5 to 40.
- A new word must cross at least one letter already on the grid.
- It may not run along an existing word.
- Cells beside a new word, other than the crossing, stay empty.
- Shared starts get one number, used by both Across and Down.
- Fewer than eight placed words is treated as failure.

The PDF

- Page 1: blank grid with starting numbers.
- Later pages: numbered Across clues, then Down clues.
- Last page: the same grid with answer letters filled in.
- Footer on every page:
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Install

Release v0.1.0 is only for ARM64 on macOS.

```
brew trust --tap Domino-Data-Systems/crossword
brew tap Domino-Data-Systems/crossword
brew install crossword
ollama pull gpt-oss:20b
```

Leave the Ollama llama icon in the menu bar before the pull.

Running it

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

The program prints the seed. Pass `--seed` to place the same words again.

Progress and load

- `--verbose` shows a progress bar on standard error.
- The bar counts usable entries while Ollama answers, then counts words as they are placed.
- The command searches remaining words in parallel.
- Requests stay small so one slow reply does not have to carry hundreds of clues.

What to watch

- Clue quality follows the model. The tool checks form, not facts.
- The grid is playable under these rules. It is not a symmetric newspaper grid.
- A narrow topic may not yield eight placeable words. Broaden the topic or ask for more candidates.
- The menu-bar Ollama app must be running, and `gpt-oss:20b` must be pulled.

Summary

- One binary, one topic, one PDF.
- Local model, seeded placement, numbered clues, filled key.
- Domino Data Systems, 2026.