

# Passage2Quizzes

Faithful C99, Rust, and Swift Ports of a Local-LLM  
Essay-and-Quiz Pipeline

Shyamal Chandra

Domino Data Systems    Industrial-track briefing

August 2026

# The industrial problem

- Instructors need a **passage + 10-item quiz + answer key** packet, as PDF.
- A 52-line Bash sketch already did it with local `ollama run llama3.2` and Pandoc.
- Shipping that sketch inside C, Rust, or Swift products is not optional.
- “Clean up the script” silently breaks BSD `sed` pagination on macOS.

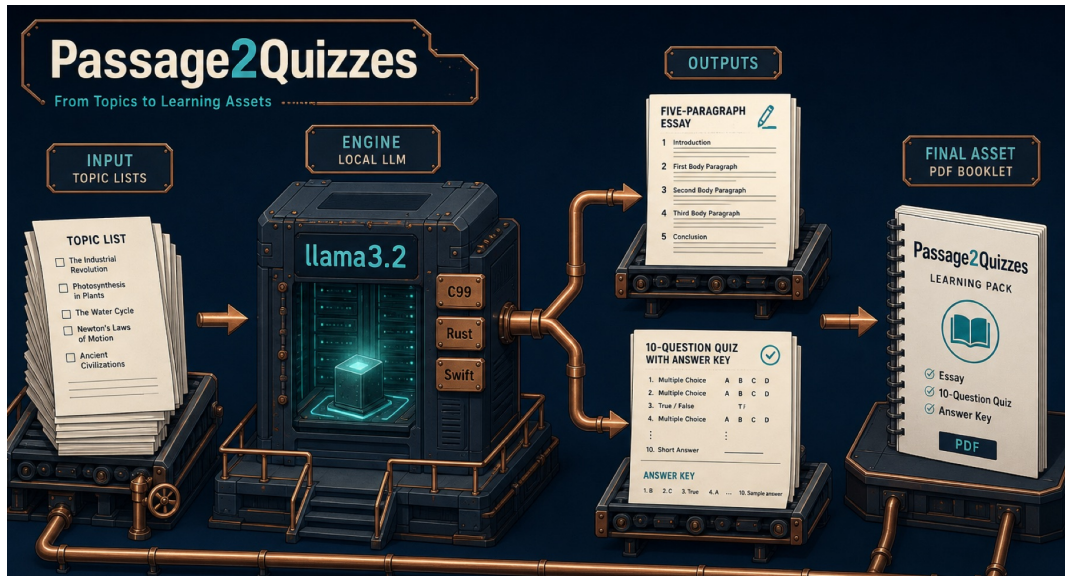
## Acceptance criterion

Byte-identical `questions.md` across three native ports, with the original prompts, timers, and UX lines preserved.

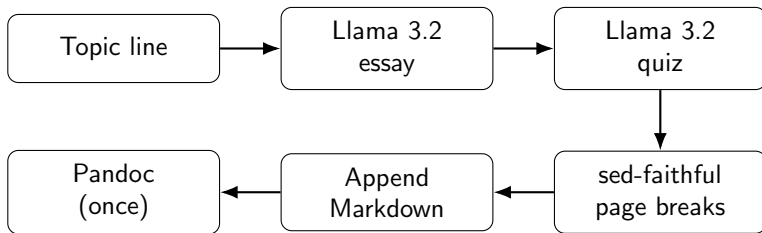
# What the operator sees

- ① `passage2quizzes topics.txt packet.pdf`
- ② Progress: Generating an essay on the topic: ...
- ③ Integer-second timers for essay and quiz
- ④ Sidecar `questions.md` in the working directory
- ⑤ Pandoc writes the PDF

Topics are **newline-separated**: one file, a batch of packets.

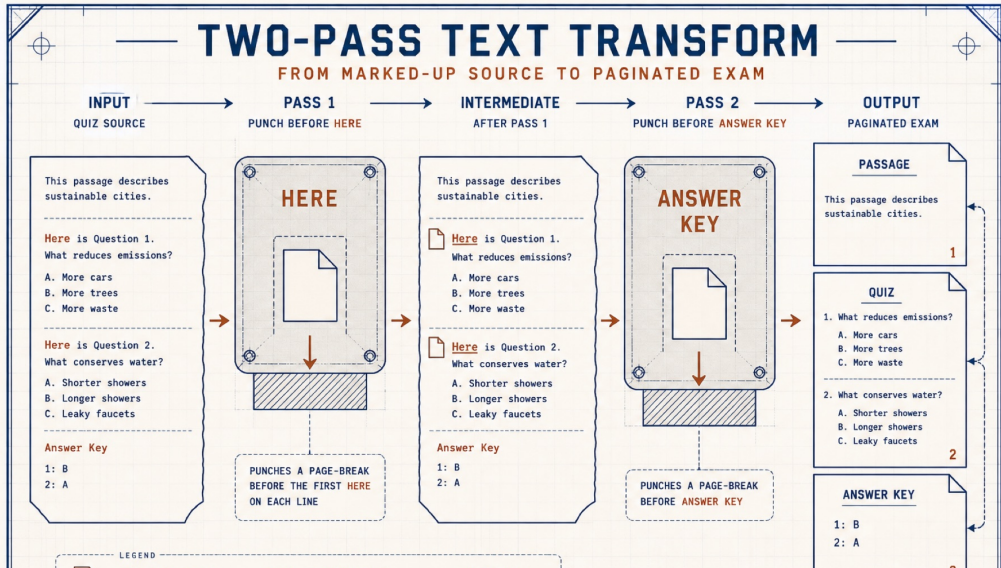


# Algorithm (per topic)



- Prompts are verbatim copies of `main.sh`.
- `exec argv`, never a quoted shell string.
- Page-break: first Here per line, then first Answer Key per line.

# Page breaks are the specification hazard



# Three ports, one artifact



# What each port is

| Lang  | Runtime            | Shape                 |
|-------|--------------------|-----------------------|
| C99   | POSIX fork/execvp  | Library + 5-line main |
| Rust  | std::process only  | No crates             |
| Swift | Foundation Process | SwiftPM executable    |

## Not a wrapper

None of the ports invoke Bash or `main.sh`. ISO C99 cannot spawn processes; POSIX is required.

# Test stations



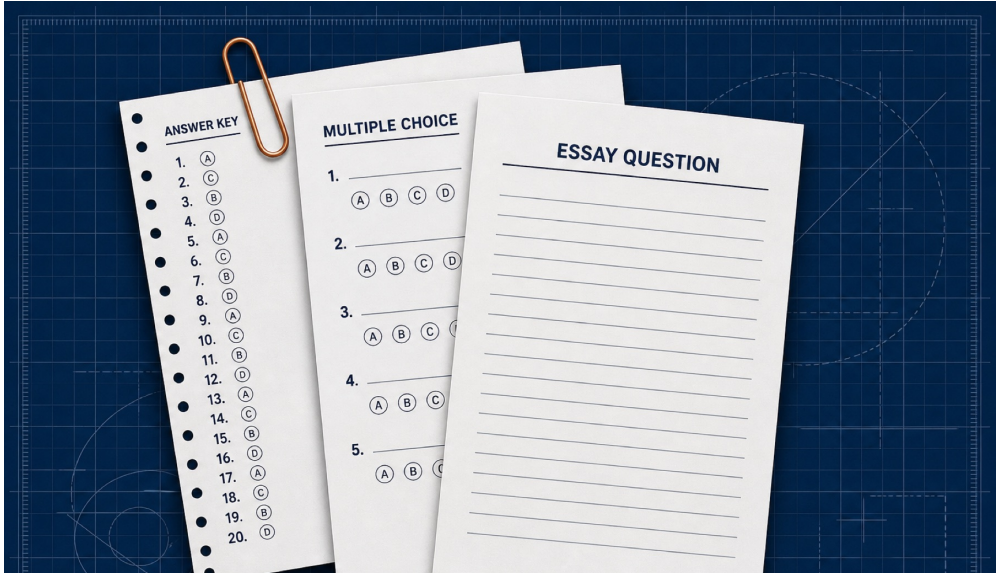
# Benchmarks (Apple Silicon)

| Metric                 | Value        |
|------------------------|--------------|
| Page-break (C99 -O2)   | 1.16 $\mu$ s |
| Assemble 3 topics      | 0.38 $\mu$ s |
| Stub pipeline C99/Rust | 60 ms        |
| Stub pipeline Swift    | 540 ms       |
| Live essay + quiz      | 8 s + 4 s    |
| Stripped C99 binary    | 35 KiB       |

## Takeaway

Port overhead is four orders of magnitude below local Llama 3.2. Spend review time on goldens, not on micro-optimizing Markdown concat.

# The packet you ship



# Future work

- Structured quiz JSON so pagination does not hunt for Here.
- Seeded Ollama decoding for live A/B of prose.
- Pandoc in CI (true PDF page-count assertions).
- Windows CreateProcess spawn.
- Human review queue before print.

# Conclusion

- ① Treat the shell script as an **oracle**, not as production code.
- ② Clone BSD sed lineation and Bash newline stripping explicitly.
- ③ Gate every language with the same golden bytes and a three-way A/B.
- ④ Then ignore port CPU: the model owns the clock.

`make test`    *and optionally*    `make test-live`

# Questions

Shyamal Chandra | Domino Data Systems

Passage2Quizzes industrial-track briefing, August 2026