# AI in Software Testing — Prompt-as-Code Workbook (Markdown Edition)

This workbook is designed to be used in a text editor or IDE. Students can paste prompts, responses, and notes directly into the file. Treat prompts like code: version them, track changes, and reflect on what worked.

Each lab has its own section with placeholders to fill in.

## Example Lab

* **Objective:** Learn how to set up Jest and write the first AI-generated test.
* **Initial Prompt:**
* Write a Jest test for a sum(a,b) function.
* **AI Output (summary):**
* Generated a passing test for sum(2,3) = 5.
* **Refinements (list each revision):**
* Prompt v2: Add negative number test
* **Final Prompt Version:**
* Write Jest tests for sum(a,b) including positive, negative, and zero values.
* **Notes / Takeaways:** Document prompts like code; version improvements.

## Lab 1: Introduction to AI in Software Testing

* **Objective:** Learn how to set up Jest and write the first AI-generated test.
* **Initial Prompt:**
* # Paste your initial prompt here
* **AI Output (summary):**
* # Paste AI output or summarize what it produced
* **Refinements (list each revision):**
* # Prompt v2  
  # Prompt v3
* **Final Prompt Version:**
* # Paste final prompt here
* **Notes / Takeaways:**

## Lab 2: Test Case Generation with LLMs

* **Objective:** Practice prompting LLMs to generate unit tests and refine prompts for better coverage.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 3: AI-Assisted Code Coverage and Refactoring

* **Objective:** Use AI to identify gaps in test coverage and refactor duplicated or verbose test cases.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 4: Testing Legacy Code

* **Objective:** Generate regression tests for undocumented or legacy code to lock in existing behavior.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 5: Exploratory and Edge Case Testing

* **Objective:** Use AI to brainstorm and generate tests for unusual, boundary, and edge-case inputs.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 6: Generating Synthetic Test Data with AI

* **Objective:** Create synthetic data sets with AI for privacy, rare scenarios, and edge case testing.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 7: Test Smells and Anti-Patterns

* **Objective:** Detect and refactor poor-quality or fragile tests with the help of AI.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 8: Testing AI Systems

* **Objective:** Learn strategies for testing non-deterministic AI outputs with resilient assertions.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 9: Test Maintenance and Flaky Tests

* **Objective:** Diagnose and fix flaky tests caused by timing, async, or environment issues.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 10: CI/CD Integration of AI-Generated Tests

* **Objective:** Automate running and integrating AI-generated tests into CI/CD pipelines.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 11: Documentation and Reporting

* **Objective:** Use AI to generate test documentation and reports for clarity and stakeholder communication.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 12: Limitations and Ethics

* **Objective:** Explore the limitations of AI-generated tests and discuss ethical considerations of using AI in QA.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**

## Lab 13: Capstone Lab

* **Objective:** Apply the full workflow: generate, refine, and integrate AI-assisted tests into a project end-to-end.
* **Initial Prompt:**
* **AI Output (summary):**
* **Refinements:**
* **Final Prompt Version:**
* **Notes / Takeaways:**