Preface

AI Assisted Programming: Better Planning, Coding, Testing, and Deployment

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Motivation

- The IDEs didn't change much, except for syntax highlighting and debugging features.
- Everything changed dramatically with the arrival of GitHub Copilot and ChatGPT.
- In natural language, I asked ChatGPT to write code. Or in VS Code, I would type a fragment of a function, and GitHub Copilot would generate a code block.
- The real power was that these tools could handle many of the tedious tasks for developers.
- Turns out, these AI tools are handy for more than just coding.
- I began using ChatGPT for
  - brainstorming app ideas,
  - drafting requirements,
  - unit tests.
- It didn't take long for me to be convinced that AI-assisted programming would be one of those must-have skills for programmers.
- AI-assisted programming is quickly evolving.

What's Covered

- **Chapter 1, "New World for Developers"**:
  - How generative AI is changing the game for coders.
  - How these AI tools are helping developers think more about the big picture and less about the nitty-gritty of coding.
  - The history of programming languages.
- **Chapter 2, "How AI Coding Technology Works"**:
  - explaining generative AI
  - why transformer models and large language models are big deals in the programming world.
- **Chapter 3, "Prompt Engineering"**:

  - Practical tips, like
    - dealing with wordy or confusing prompts
    - deterring AI from making stuff up.
  - It breaks down the key parts of a prompt and shows you how to use them effectively.
- **Chapter 4, “GitHub Copilot”**:
  - The core features like creating code with comments, Chat, and using an AI-powered command-line interface.
  - Customizing the system for proprietary codebases.
- **Chapter 5, “Other AI-Assisted Programming Tools”**:
  - The other top AI-assisted programming tools
- **Chapter 6, “ChatGPT and Other General-Purpose LLMs”**:
  - How to use these tools for tasks like handling regular expressions, starter code, and GitHub Actions.
- **Chapter 7, “Ideas, Planning, and Requirements”**:
  - Using chatbots to kick off software projects.
  - This involves topics like
    - brainstorming
    - market research
    - requirements documents
    - test-driven development
- **Chapter 8, “Coding”**:
  - Common scenarios for development, whether working with APIs, using modular programming, or refactoring.
  - Handling functions and object-oriented programming.
- **Chapter 9, “Debugging, Testing, and Deployment”**:
  - fixing bugs,
  - using AI-assisted programming tools for code reviews,
  - making unit tests, and
  - describing pull requests.
- **Chapter 10, “Takeaways”**:
  - This is a wrap-up of the book, emphasizing the main points.

How This Book Is Different

- When you give a program certain input, you always get the same output. For ages, this pure deterministic logic was the heart and soul of software.

- But when you use AI-assisted programming tools, things get a bit topsy-turvy.
  - Getting results is like rolling dice since everything works on probabilities.
  - When you prompt an AI tool to whip up some code, and even use the same prompt over multiple tries, you might get different results each time.

Who Should Read This Book

- This book is for any developer, whether you're just starting out or you've been in the game for many years.

Using Code Examples

- Supplemental material (code examples, exercises, etc.) is available for download at
- https://github.com/ttaulli/AI-Assisted-Programming-Book.

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