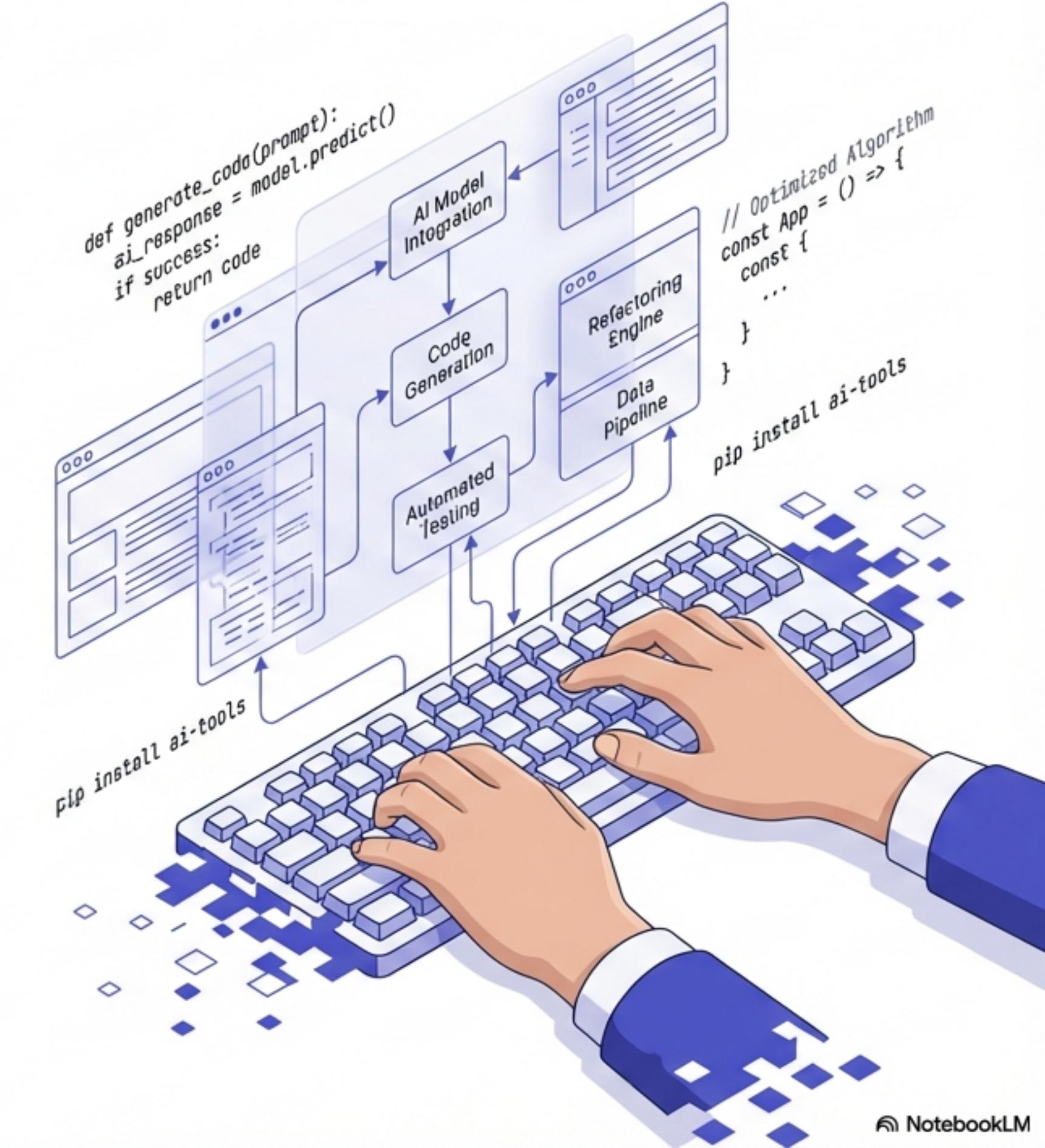


A Practical Developer's Guide for Undergraduates

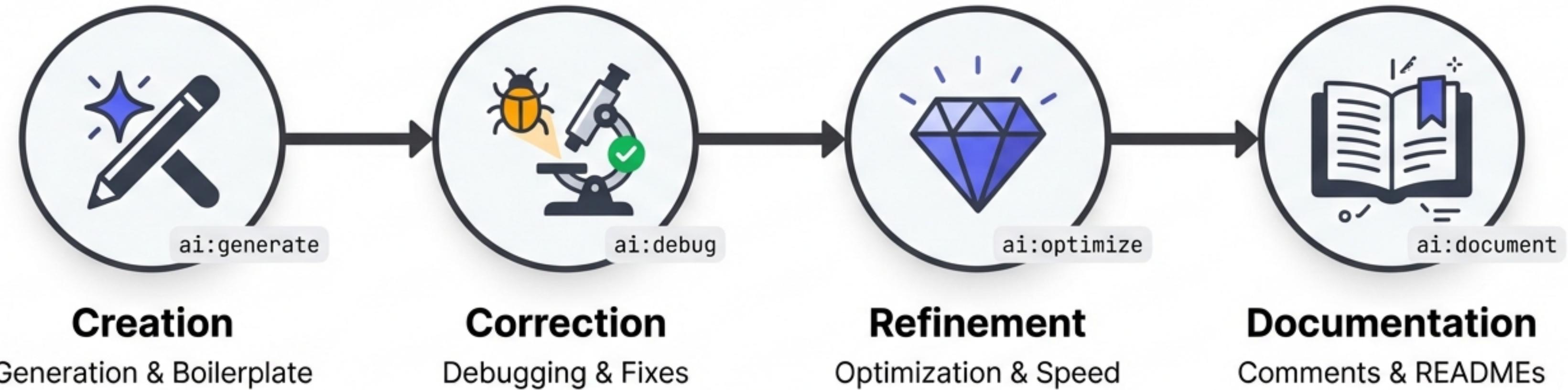
AI for Coding

The Modern Developer's Workflow

Anshul – AIML Trainer, Skilloceans



The AI-Augmented Workflow



Sidebar

Agenda Items:

- AI Tools Overview (Integrated into each phase)
- Lab Activity (Practical simulation)



From Coder to Architect

What is AI for Coding?

It is using AI to assist developers, not replace them.

We shift from typing syntax to designing logic.

The Old Way



- Manual Typing
- Syntax Hunting
- Slow Iteration

The AI Way



- **Speed:** Faster cycles
- **Accuracy:** Reduced errors ✓
- **Throughput:** Focus on Logic ✓

Anshul's Tip:
Focus on the logic.
Let AI handle the
syntax.

Phase 1: Creation and Generation

Core Tasks:

- **Writing Code from Prompts:** Turning natural language into executable syntax.
- **Boilerplate Creation:** Instantly generating headers, imports, and setup.
- **Scripting:** On-demand functions for specific tasks.
- **Scope:** Covers Web (HTML/JS) and Backend (Python).

Prompt: Create a Python function to calculate Fibonacci numbers.

```
def fibonacci(n):  
    if n <= 0:  
        return []  
    elif n == 1:  
        return [0]  
    else:  
        list_fib = [0, 1]  
        while len(list_fib) < n:  
            next_fib = list_fib[-1] + list_fib[-2]  
            list_fib.append(next_fib)  
    return list_fib  
  
# Example usage  
print(fibonacci(10))
```

The Creation Toolkit



ChatGPT

Best for general purpose coding in **Python & JS**. Ideal for starting from scratch.



GitHub Copilot

The **Inline Assistant**. Best for real-time **code completion** within your editor.



Amazon CodeWhisperer

Specialized for cloud integrations and backend code.



Replit AI

Browser-based environment for instant setup and sharing.

Phase 2: Debugging and Detection

The Crash

```
● ● ●  
RuntimeError: Division by zero at line 42...  
Traceback (most recent call last):  
  File "script.py", line 42, in <module>  
    result = a / b  
ZeroDivisionError: division by zero
```

Cryptic error messages and runtime failures halt progress.

The Fix



I see the issue. You are dividing by zero in the loop. Here is the protected code:

```
...  
if b != 0:  
    result = a / b  
else:  
    print("Error: Division by zero encountered.")  
...
```

- Translating “computer speak” to English.
- Identifying root causes instantly.
- Suggesting corrected logic.

Tools for Real-Time Repair

Chat vs. Editor in Inter with JetBrains Mono accents

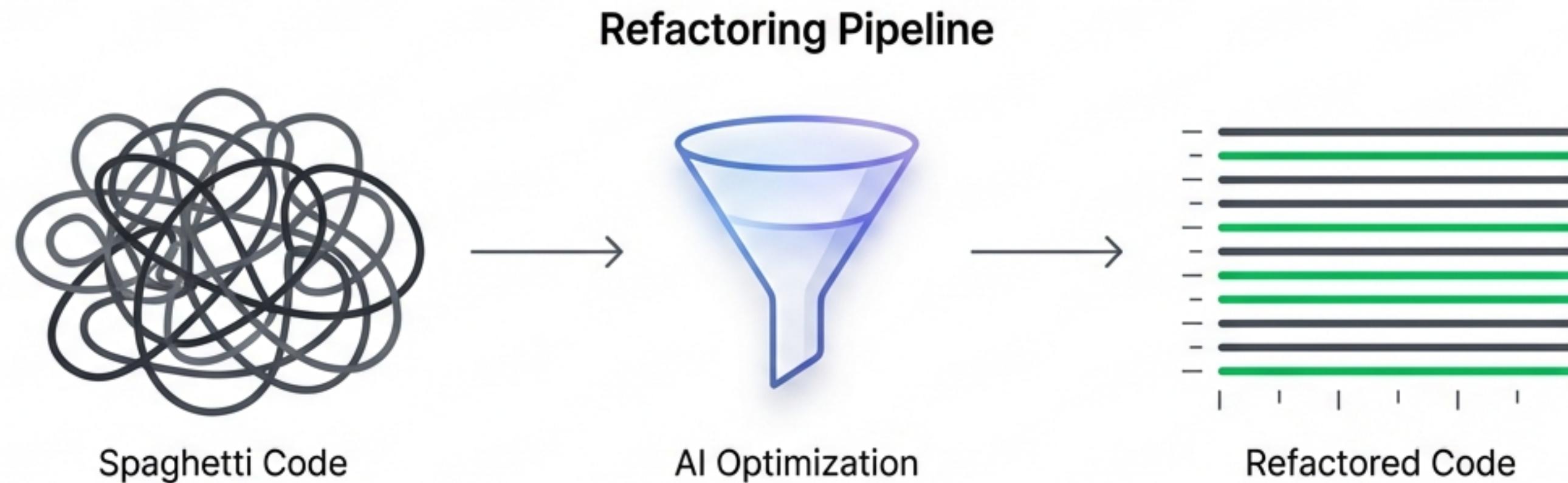


Tool Capabilities: Inter

- ChatGPT: Deep explanation of complex logic bugs.
- GitHub Copilot: Alternative code paths.
- Replit AI: In-browser error detection.
- Cursor IDE: Fully AI-native debugging.

Phase 3: Optimization and Refactoring

From “It Works” to “It Works Well”



Refactoring

Cleaning structure for readability. Improving organization and clarity in codebases.

Complexity O

Reducing logic knots (Big O notation symbol). Simplifying algorithms to minimize computational steps.

Performance

Speeding up execution. Optimizing resource usage and execution time for faster results.

Best Practices

Enforcing industry standards. Applying linters, static analysis, and standardized patterns.

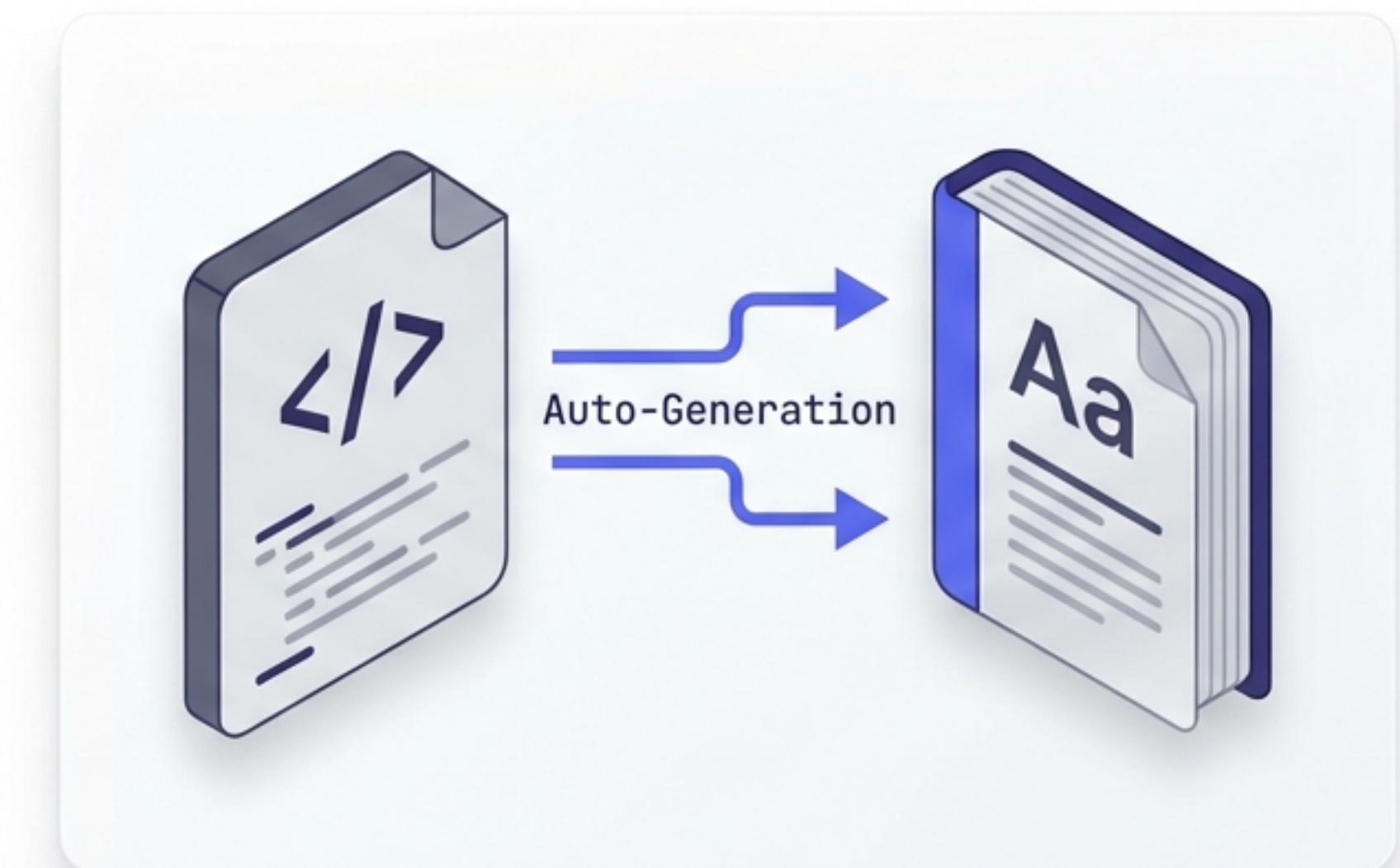
Phase 4: Securing the Legacy

Documentation Generation

The Challenge: Undocumented code is dead code.

AI Capabilities:

- **Auto Comments:** Line-by-line explanations.
- **Function Summaries:** What does this block do?
- **READMEs:** The instruction manual for your repo.
- **API Docs:** Standardized references.



The Documentation Toolkit



ChatGPT

JetBrains Mono

Drafting

Quick comments and initial README drafts.



GitHub Copilot

JetBrains Mono

Inline

Real-time comments as you type code.



Mintlify

JetBrains Mono

Publisher

Generates full documentation websites from codebase.



Scribe

JetBrains Mono

Workflow

Automates step-by-step guides and screenshots.

Lab Simulation: Python Scripting

Task

Generate a Python script to scrape news headlines.



Prompt

Write a Python script using BeautifulSoup to scrape headlines and save to CSV.



Output

```
import requests
import pandas as pd
from bs4 import BeautifulSoup

def scrape_headlines():
    url = 'https://example.com/news'
    response = requests.get(url)
    soup = BeautifulSoup(response.content, 'html.parser')
    headlines = [h2.get_text() for h2 in soup.find_all('h2')]
    df = pd.DataFrame({'Headline': headlines})
    df.to_csv('headlines.csv', index=False)

scrape_headlines()
```

Anshul's Tip

Always iterate! The first output is a draft. Ask for error handling in the second prompt.

Lab Simulation: Web Development

Create a responsive landing page for a coffee shop.

index.html | JetBrains Mono

```
<html>
  <head>
    <title>Coffee Shop</title>
  </head>
  <body>
    <div class="hero">
      <h1>Fresh Brew</h1>
      <button class="contact-btn">Contact</button>
    </div>
  </body>
</html>
```

Live Preview | JetBrains Mono

Checklist | JetBrains Mono

- ✓ Structure created? Yes
- ✓ Styling applied? Yes
- ✓ Ready for customization? Yes

Fresh Brew

Contact

The Productivity Impact

Manual Workflow vs. AI Workflow

	MANUAL WORKFLOW JetBrains Mono	AI WORKFLOW JetBrains Mono
Speed JetBrains Mono	 Hours	 Minutes
Syntax Errors	 Frequent	 Rare
Focus	 Syntax & Typing	 Logic & Architecture
Learning Curve	 Steep/Frustrating	 Supported/Guided 

AI doesn't replace learning; it accelerates the 'aha!' moments. 

Building the Future

Summary Checklist

- █ Generated code instantly
- █ Debugged with a virtual partner
- ✓ Optimized for performance
- ✓ Documented for clarity

“The future of coding isn’t about how fast you type. It’s about how clearly you think.”

