

BUILDING RELIABLE UNIX TOOLS WITH AI

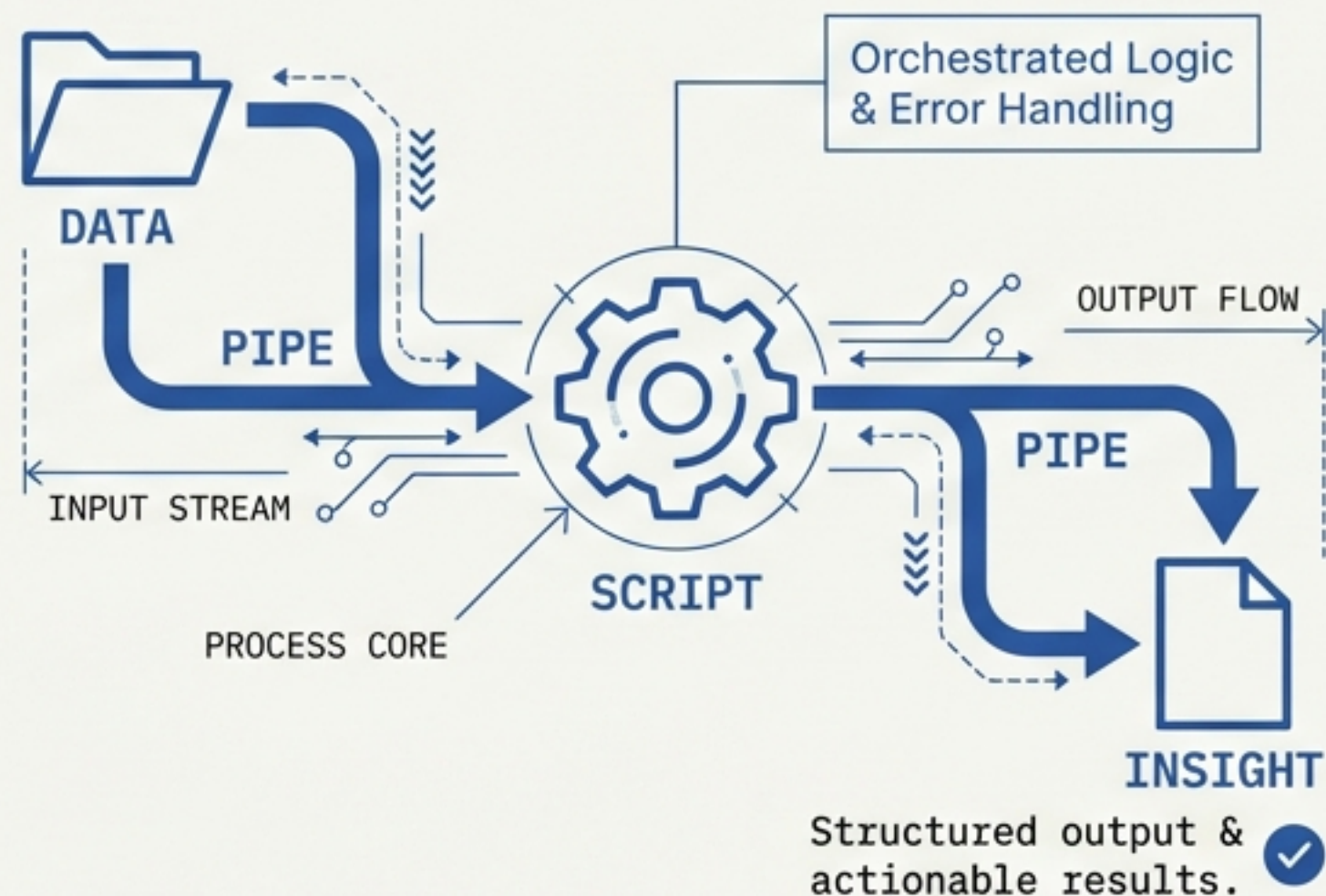
From Broken Math to Orchestrated Workflows

THE GLITCH



↳ Imprecise arithmetic & unhandled floating-point errors.

THE ARCHITECTURE



Reliable, maintainable, and accurate workflows through intelligent design.

THE BASH TRAP

```
echo $((10/3))
```

3

Silent Truncation

Integer-only math deletes decimals.

THE LLM TRAP

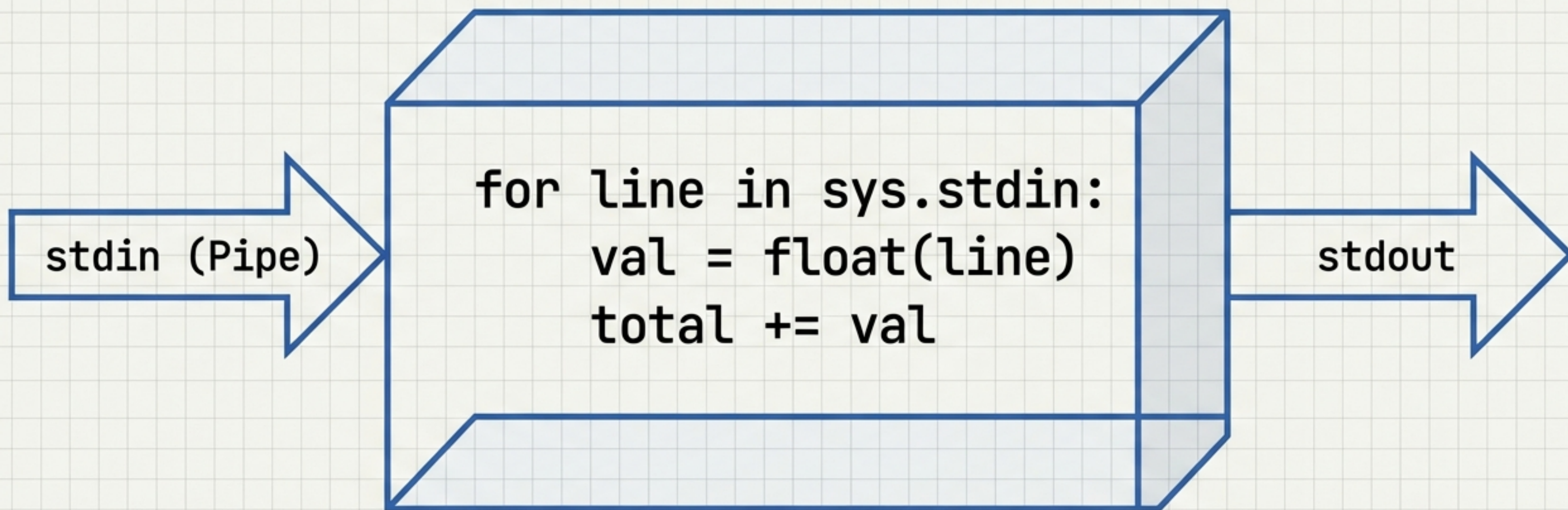
12.50, 8.75, ... 5.00

Prediction != Computation

AI models predict, they do not calculate.

Rule: If it is math, ask AI to write code that calculates.
Never ask AI to calculate.

The Agent is the Coder. Python is the Calculator.



The Director's Move: Prompt for behavior ("read from stdin"), not just an answer.

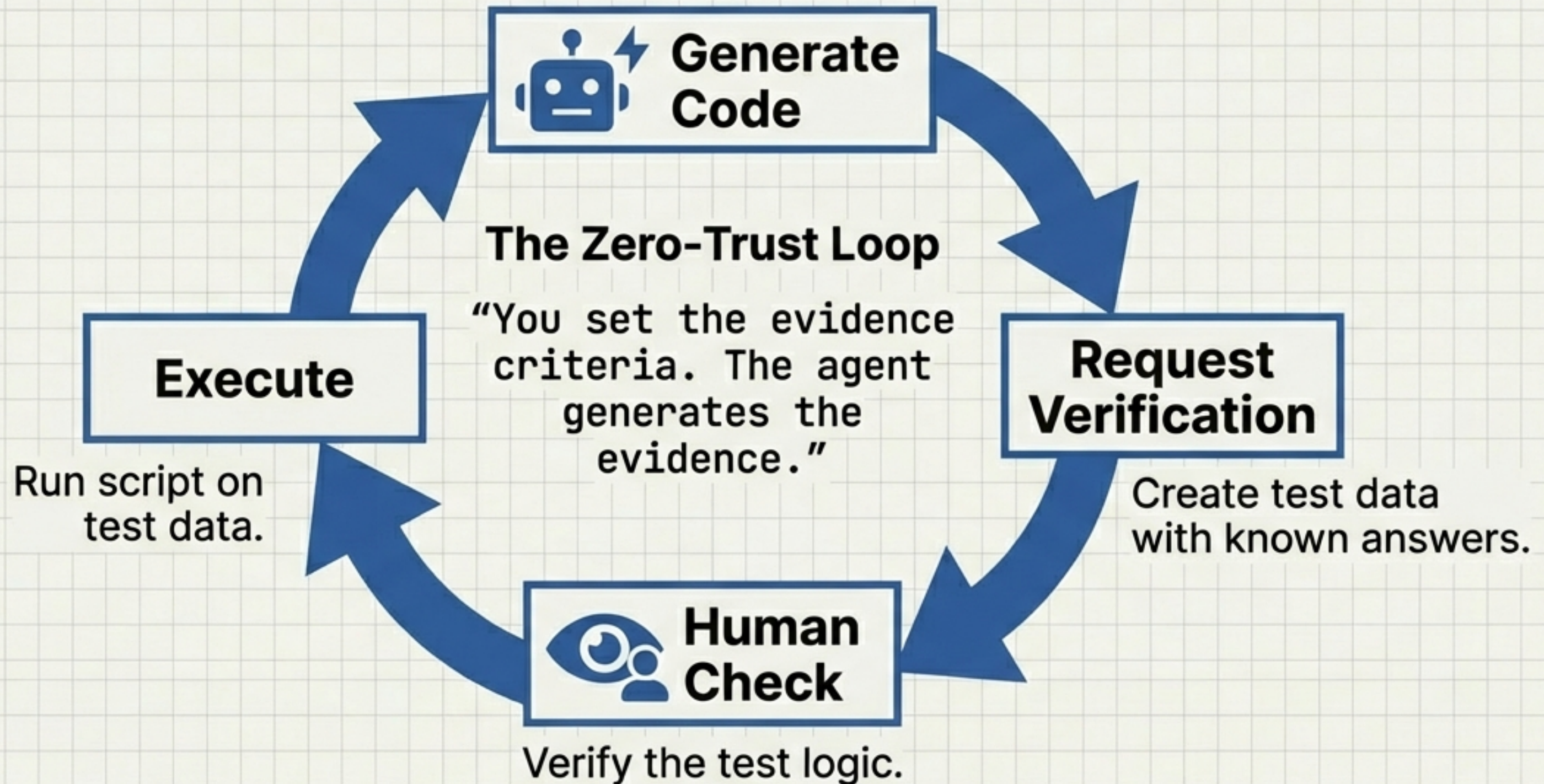
Exit Code 0 is a Lie



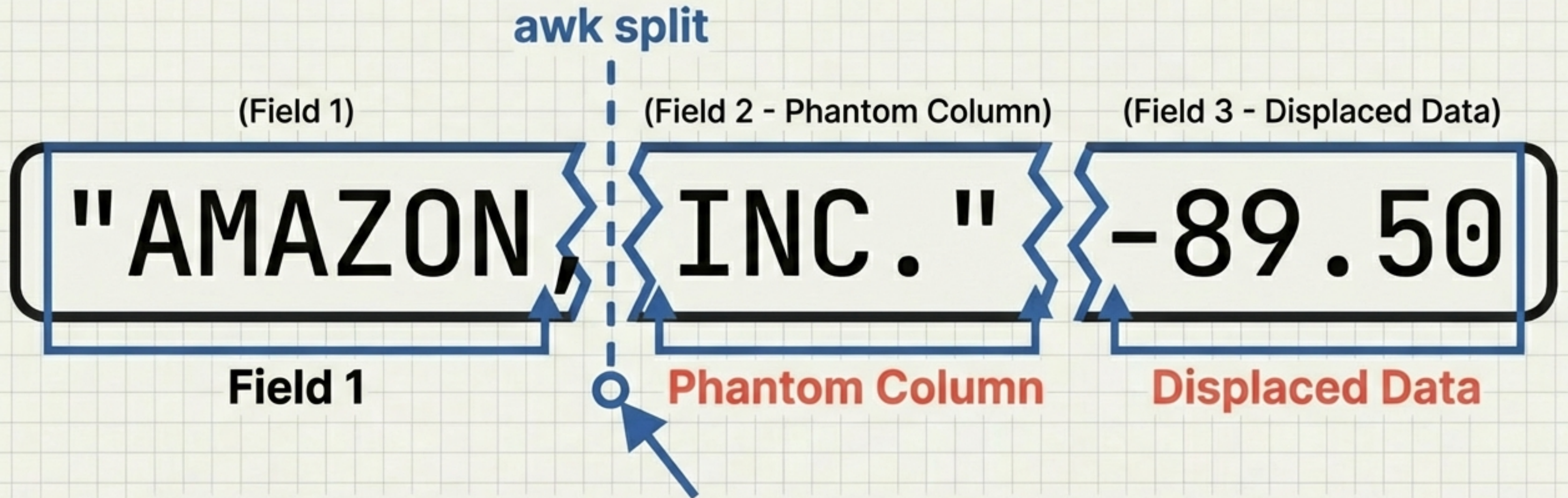
Input:	10, 60, 30
Script Logic:	if line starts with 6: skip
Output:	Total: 40.0
System Status:	Exit Code 0 (Success)

Means "Didn't Crash".
Does NOT mean "Correct".

Trust is Earned Through Verification.



Real Data Fights Back

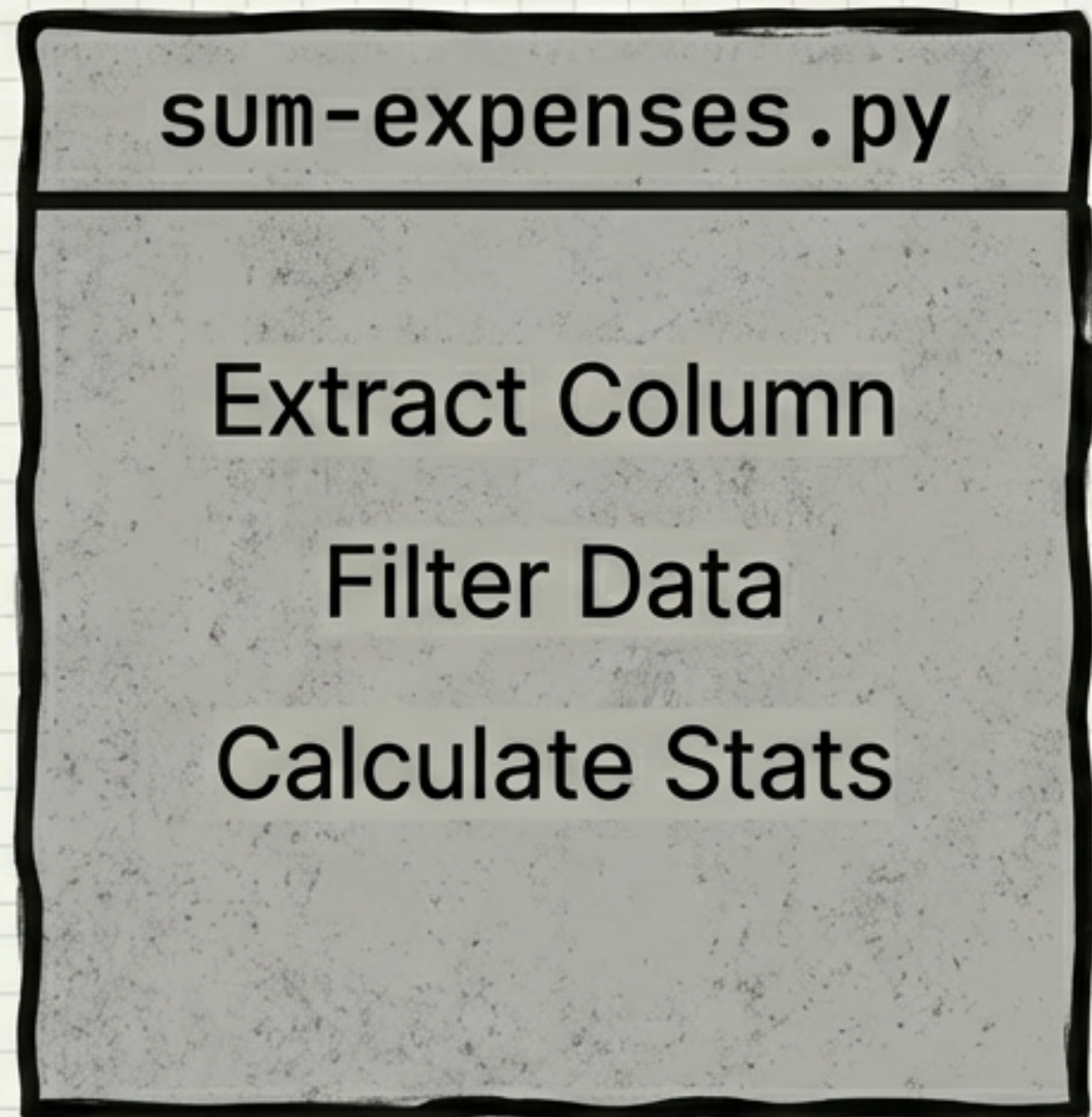


The Trap: Simple splitters see delimiters, not quotes.

The Fix: Use Python's `csv` library for robust parsing.

Decomposing the Monolith.

BEFORE



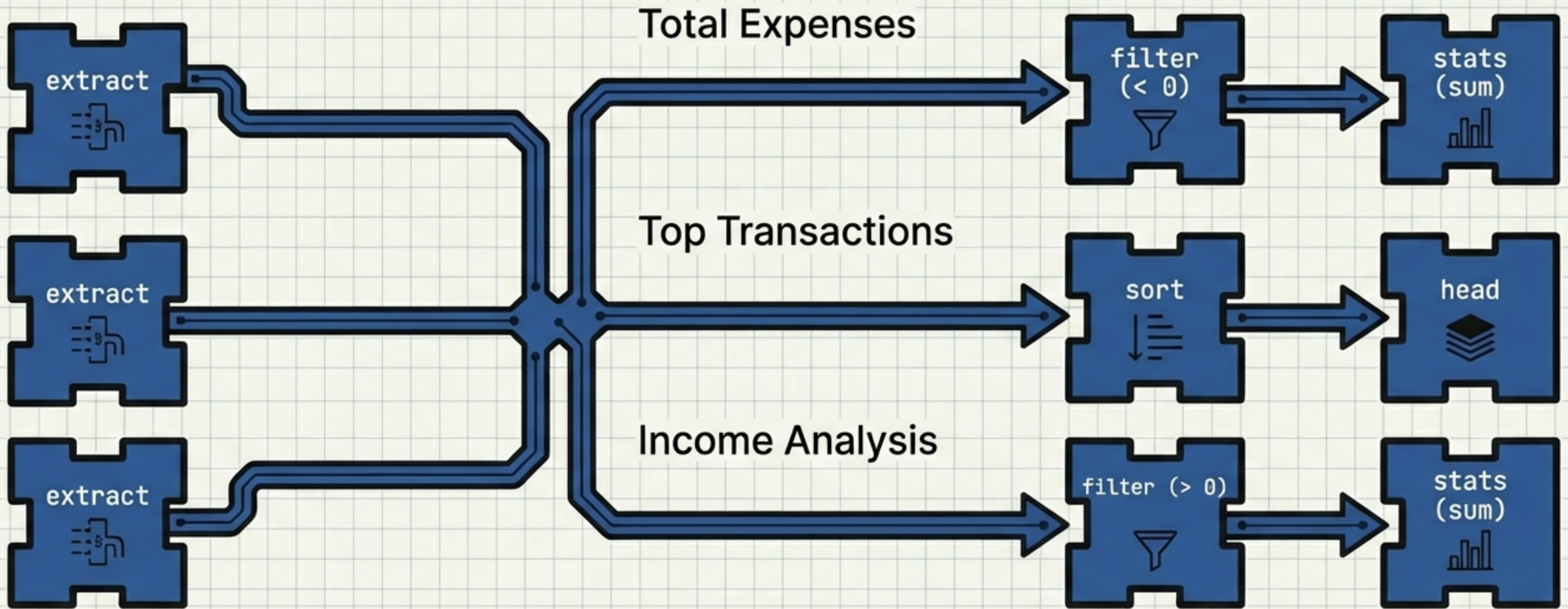
AFTER



Unix Philosophy: One Tool, One Job.

If **filter** breaks, **stats** remains safe.

The Power of the Pipe



The data is fixed. The pipeline is flexible.

The "Dr. Pepper" Trap.

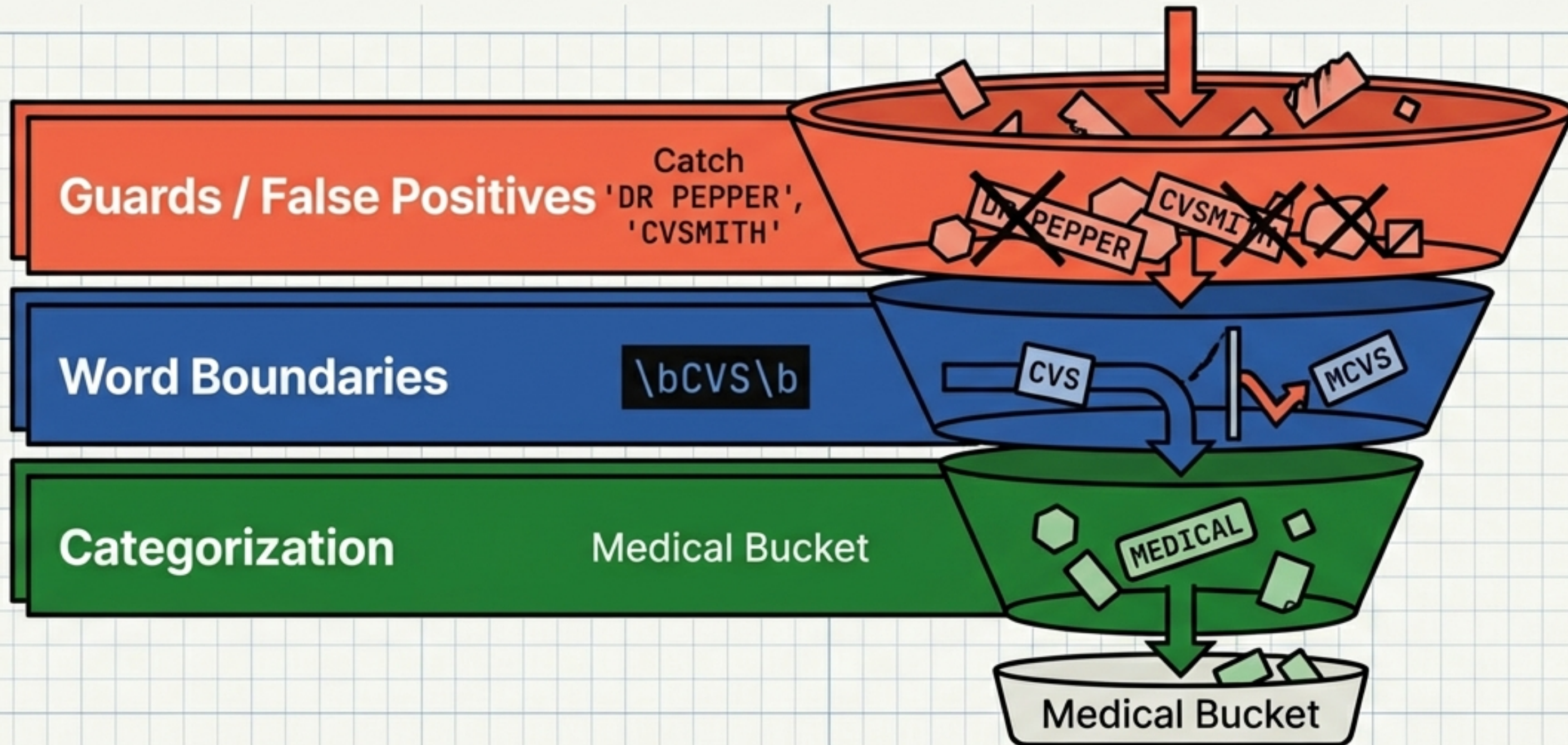
DATE: 2023-10-12 | DESC: DR PEPPER SNAPPLE GRP | AMT: \$4.50
DATE: 2023-10-12 | DESC: DR PEPPER SNAPPLE GRP | AMT: \$4.50

MEDICAL DEDUCTION

Regex: /DR/

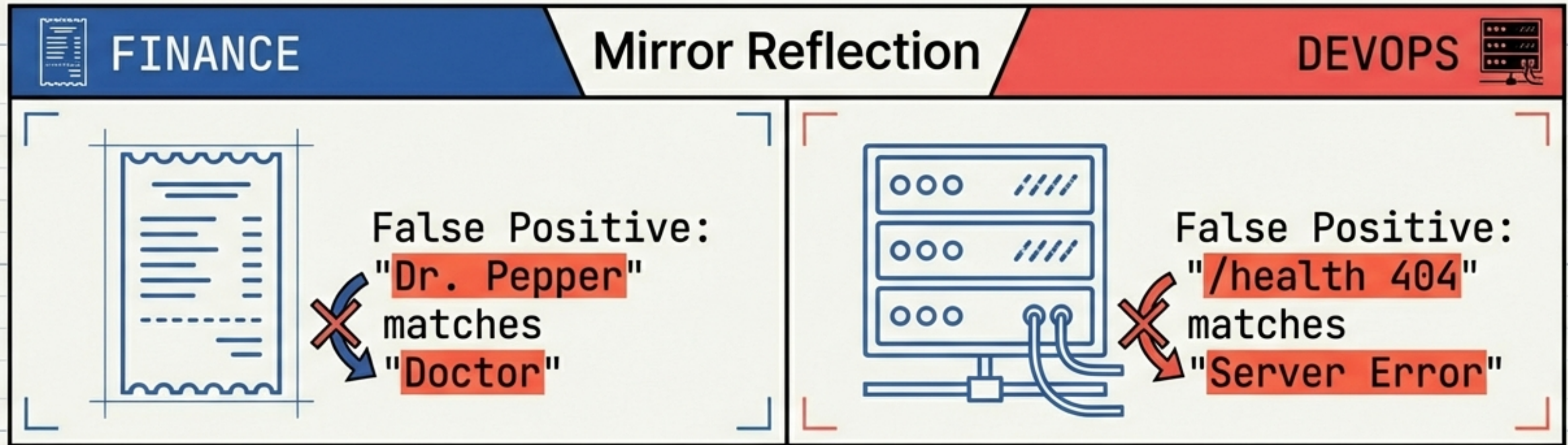
Simple keyword matching creates fraud by Algorithm. A soda is not a doctor.

Advanced Guards & Boundaries



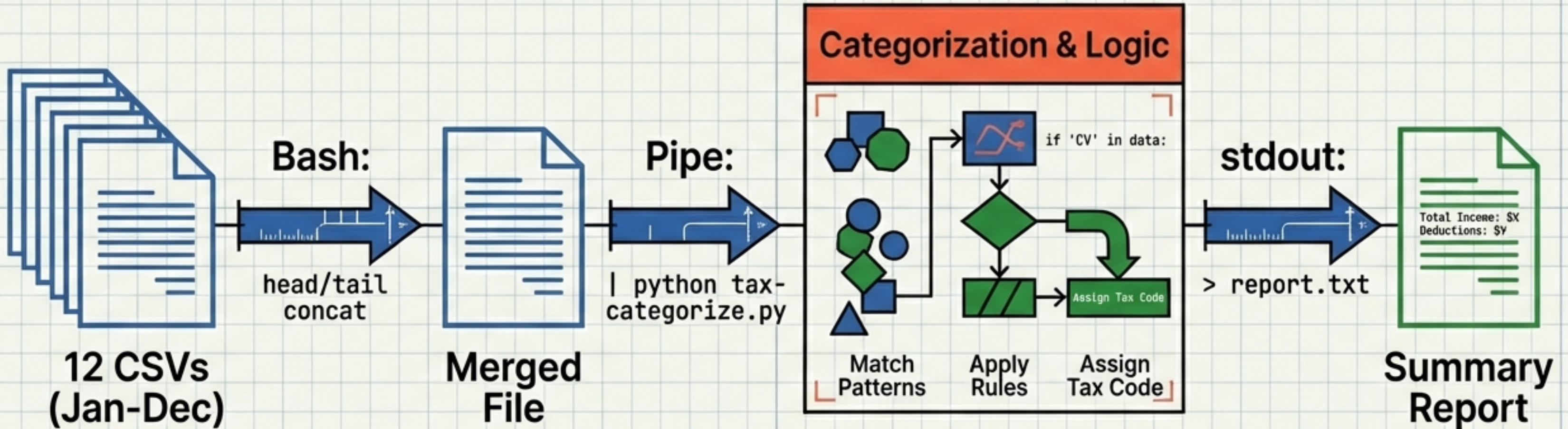
Execution Order: Guards must run **BEFORE** categories.

It's Not Just About Money



The Pattern is Universal: Verify -> Guard -> Categorize.

Orchestration: The Tax-Ready Pipeline



Combining Bash for file management and Python for logic.

Automation Should Admit Ignorance

Medical:	\$500.00
Business:	\$200.00

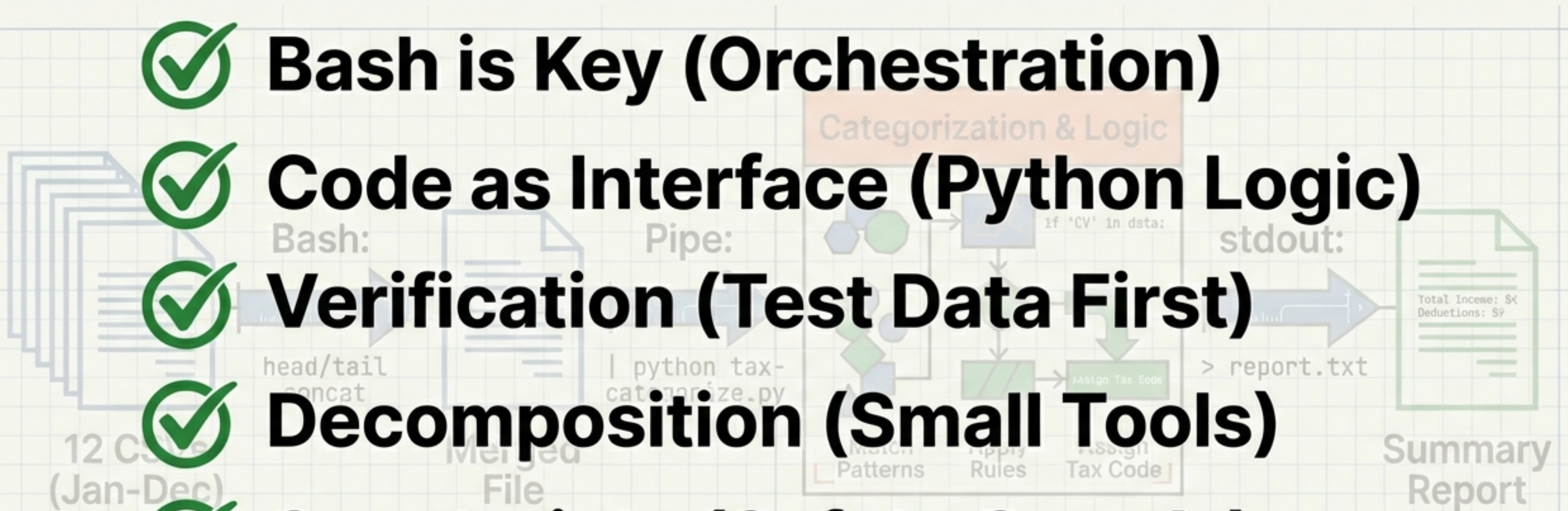
*** NEEDS REVIEW ***

Transaction: 'UNK-VEN-882'
- No category match found.

A good tool flags ambiguity for human judgment rather than making a silent error.

Seven Principles in Action

- ✓ **Bash is Key (Orchestration)**
- ✓ **Code as Interface (Python Logic)**
- ✓ **Verification (Test Data First)**
- ✓ **Decomposition (Small Tools)**
- ✓ **Constraints (Safety Guards)**



Reliability is not an accident. It is an architecture.

The Director's Manifesto

1. You describe the **DATA PROBLEM**.
2. You define the **INTERFACE** (stdin/stdout).
3. You set the **EVIDENCE CRITERIA** (test cases).
4. The Agent builds the **IMPLEMENTATION**.

Build your library. Verify everything.