Beyond the Prompt:
An Empirical Study of Cursor Rules

Shaokang Jiang
shj@uci.edu

Daye Nam
dnam1@uci.edu

UC Irvine Donald Bren School of
Information & Computer Sciences

From Autocompletion to Persistent Rules


```
// write a binary search algorithm
const binarySearch = (arr, target) => {
    let left = 0;
    let right = arr.length - 1;
    let middle = Math.floor((left + right) / 2);
    while (arr[middle] !== target && left <= right) {
        if (target < arr[middle]) {
        right = middle - 1;
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    }
    return arr[middle] === target ? middle : -1;
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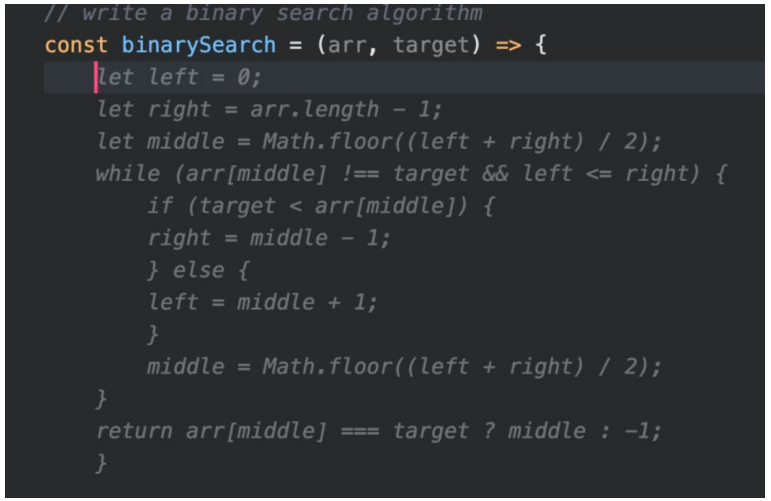
Autocompletion

From Autocompletion to Persistent Rules



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Prompt Engineering

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GitHub Copilot

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Autocompletion

H you are a python developer tasked with writing an application…

Ask LLM…
+ ⌥

Prompt Engineering

CURSOR

CLAUDE CODE

rule.mdc / SKILL.md

Always use X for styling
Conduct a comprehensive security review of this code
…

Rules/skills

From Autocompletion to Persistent Rules

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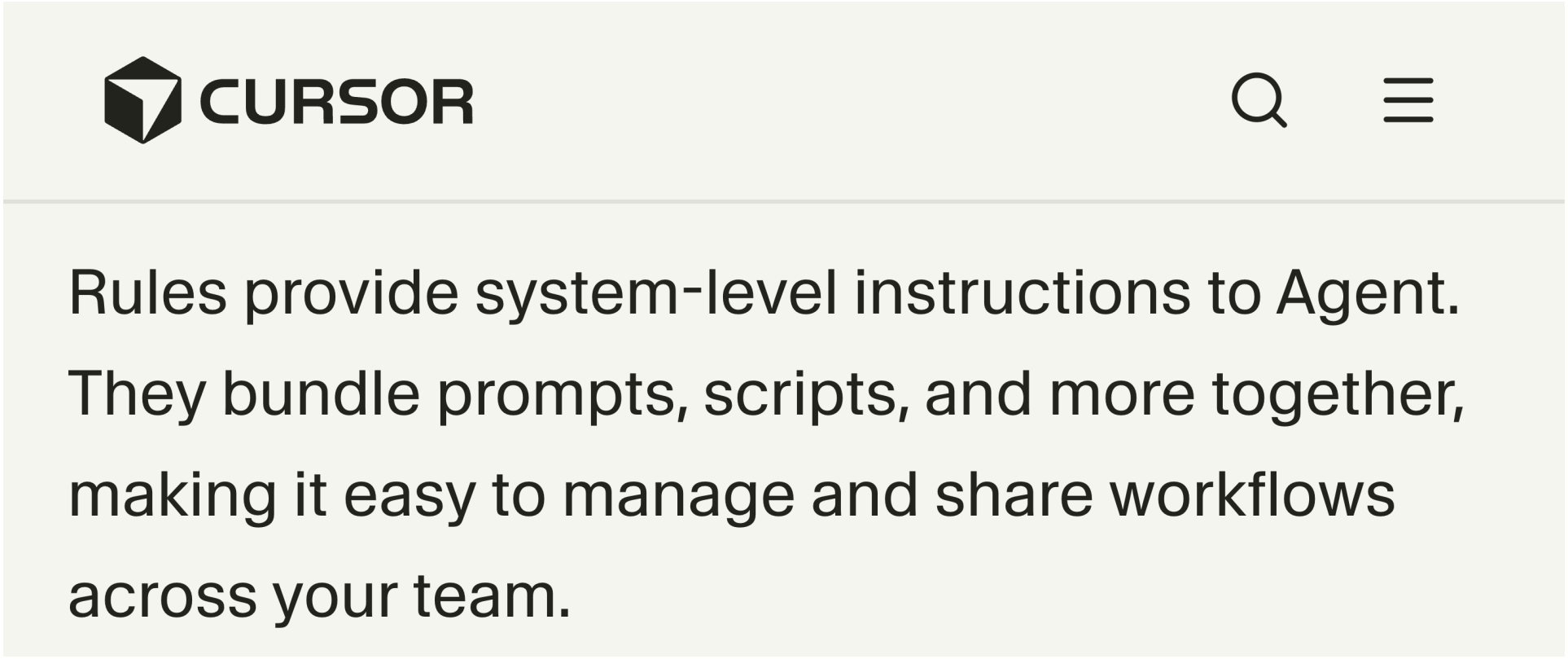
Rules/skills New!

Cursor Rule



https://cursor.com/docs/rules

Cursor Rule Example

frontend-development.mdc

This rule provides standards for frontend components:

- `setup/`: Setting up the environment.
- Use CamelCase
- Maintain module separation of concerns.
- Always ask clarifying questions if context is missing
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Qualitative Analysis

Data Collection

Sourcegraph for Public Code

Search repo
repo:has.file(path:.mdc$)

GitHub

Fetch repo and metadata
Github API

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- Aug 29, 2025

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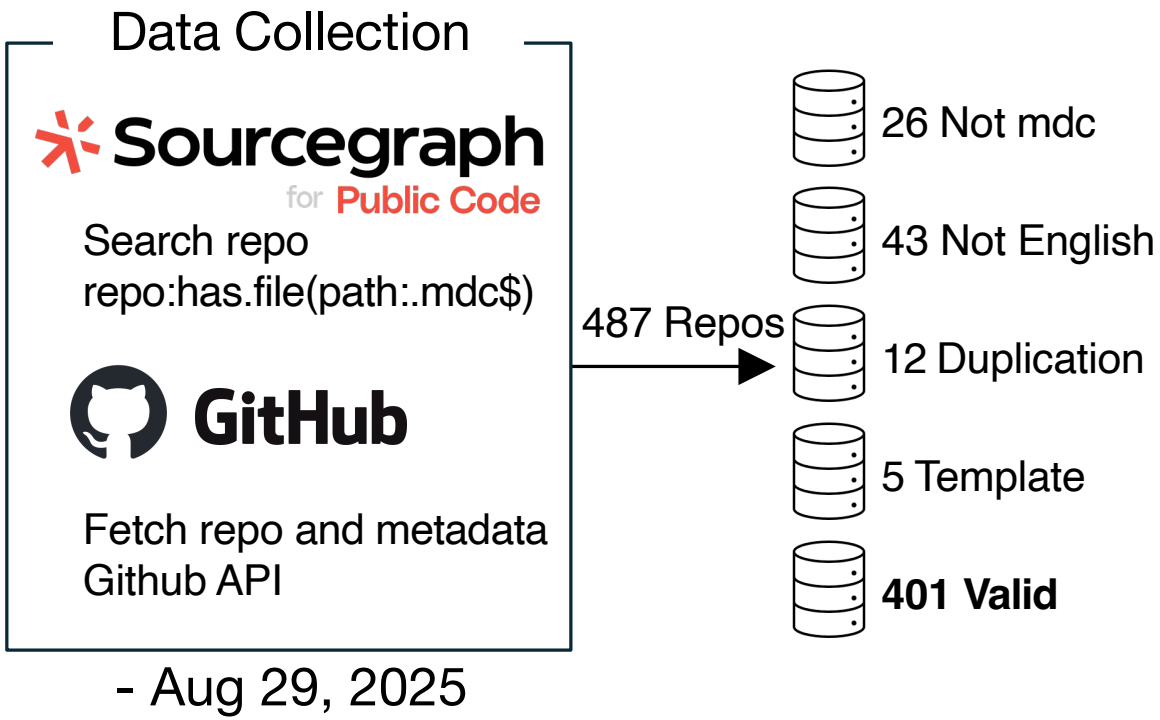

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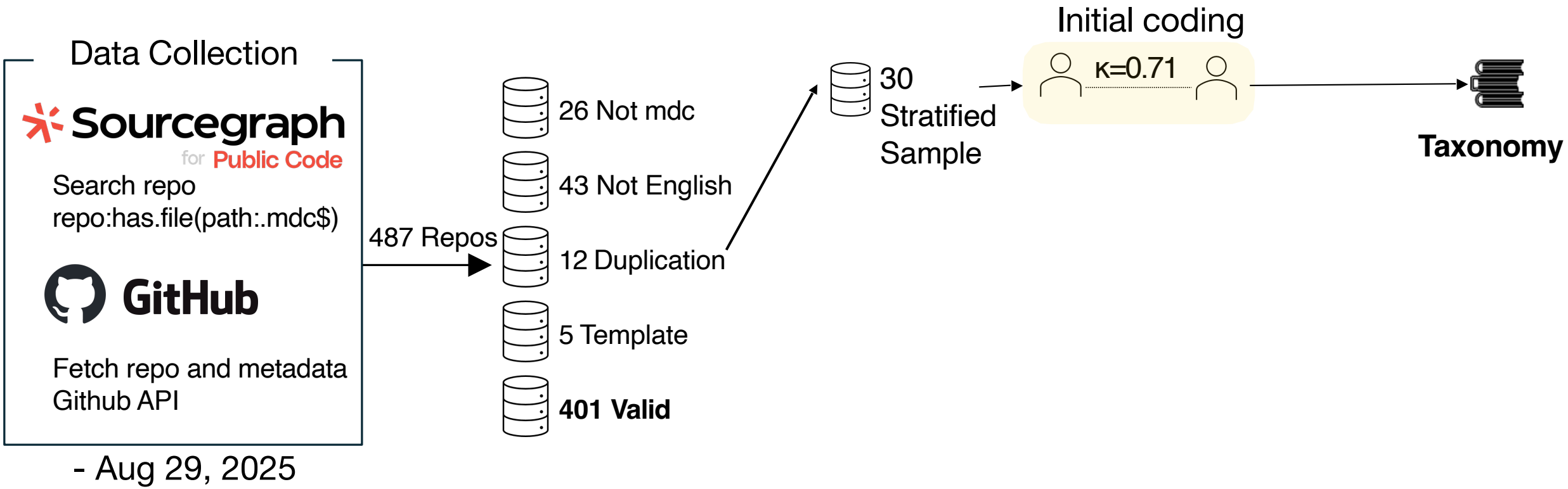

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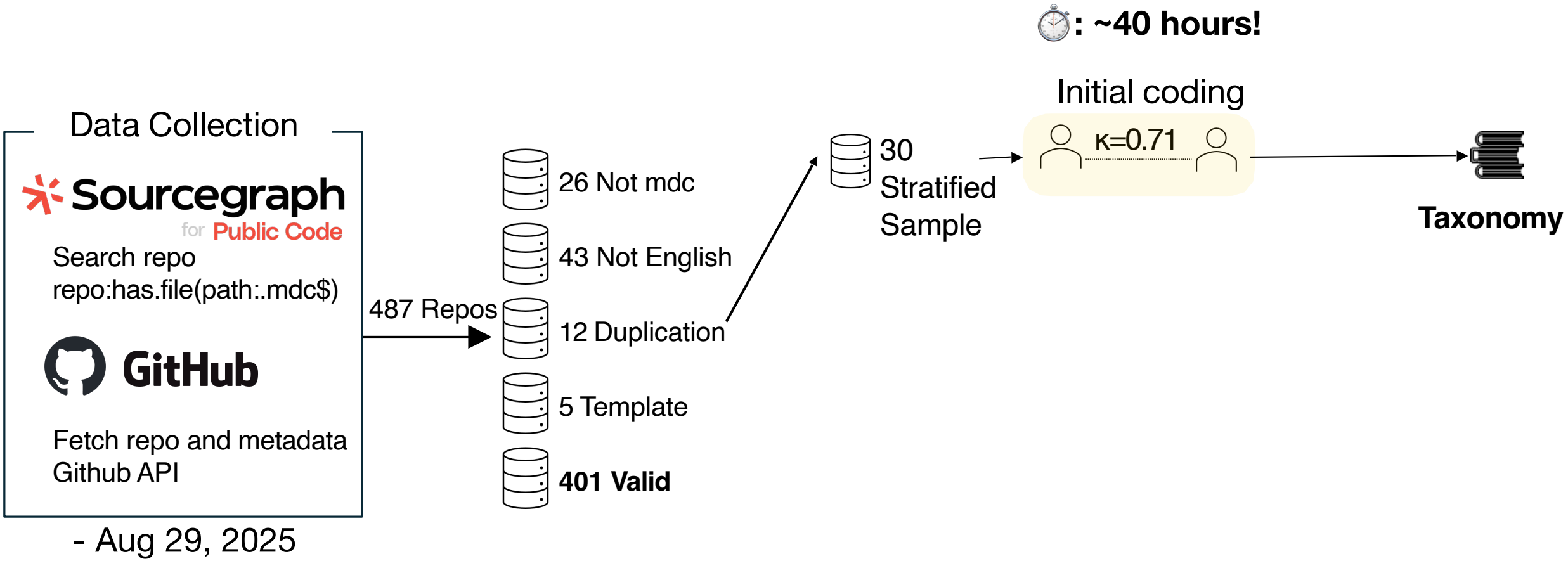

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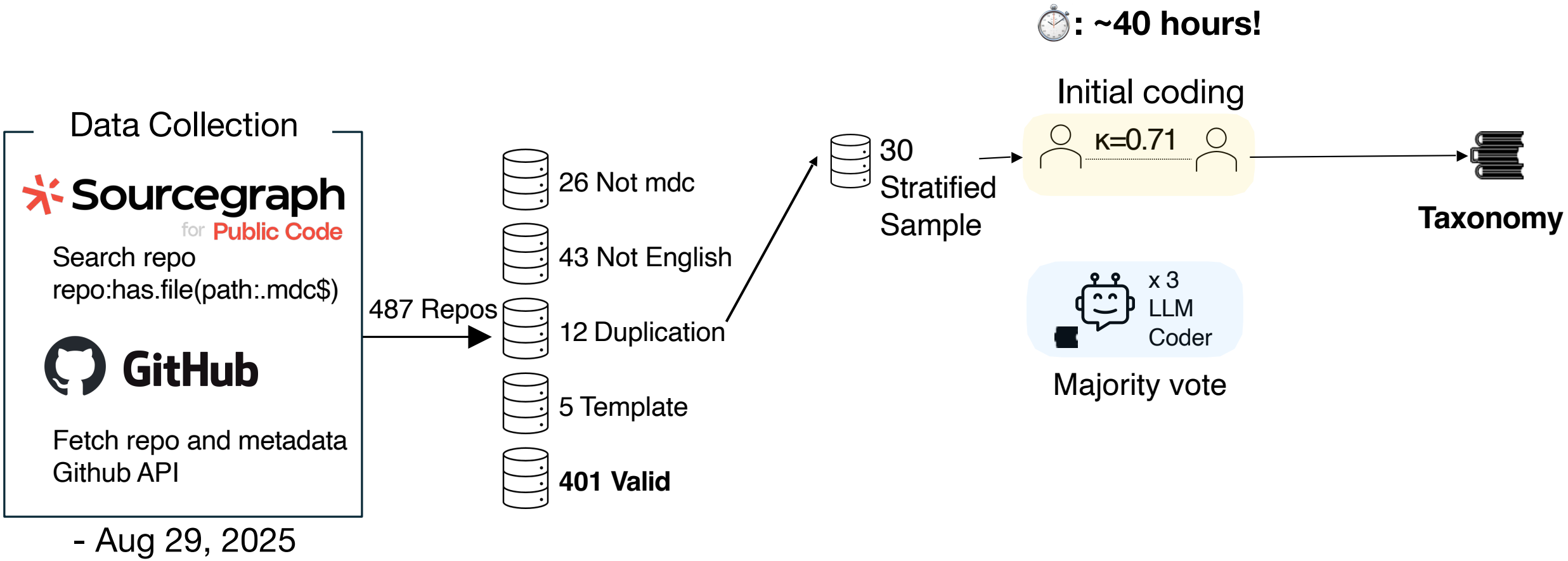

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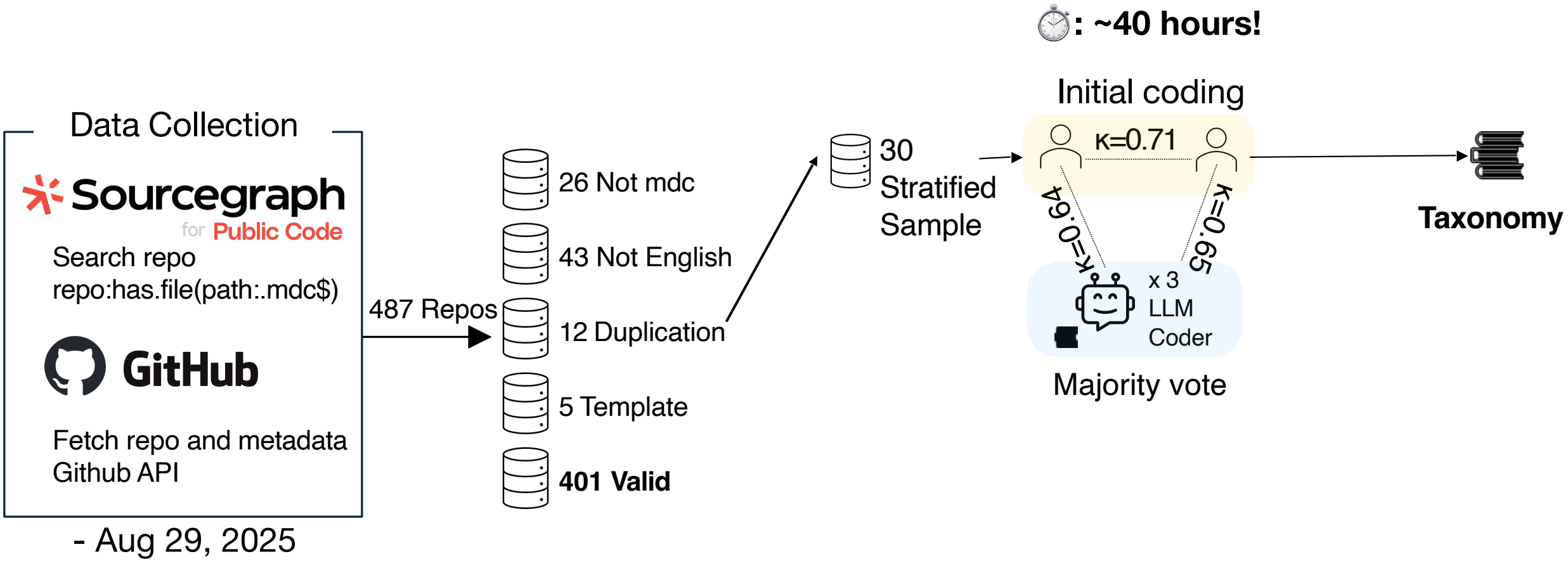

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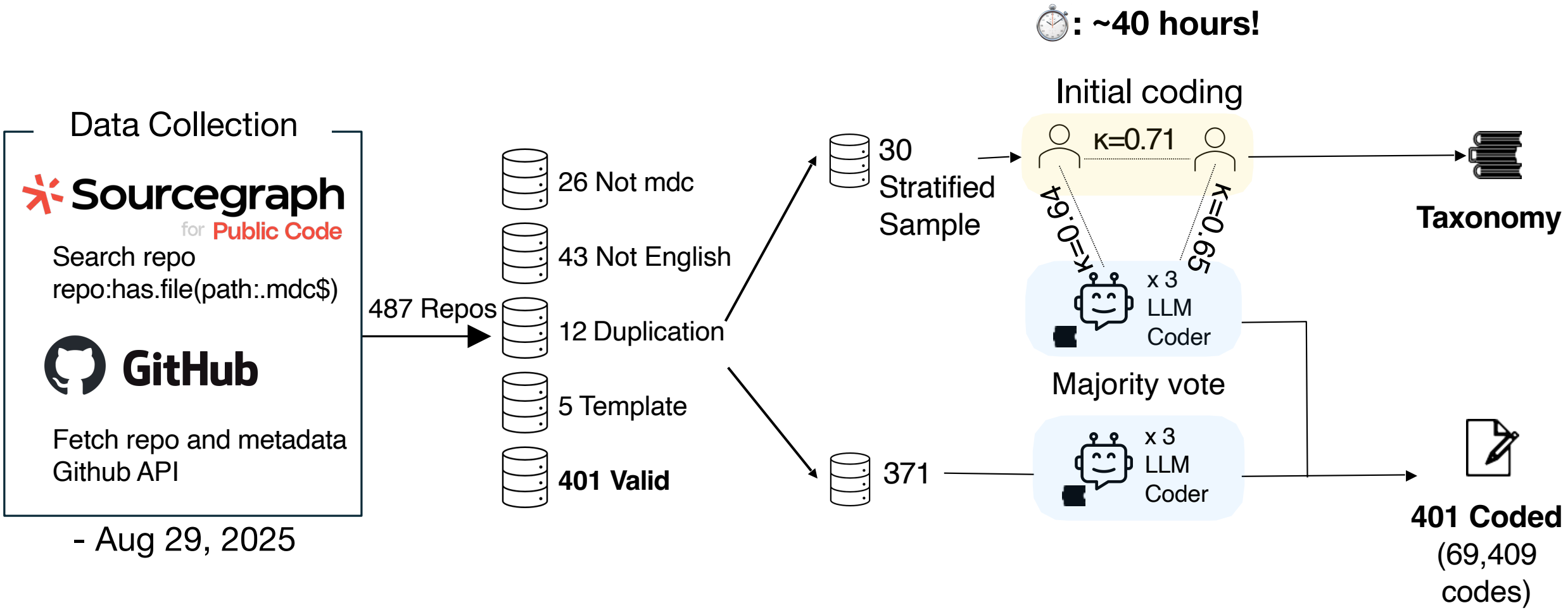
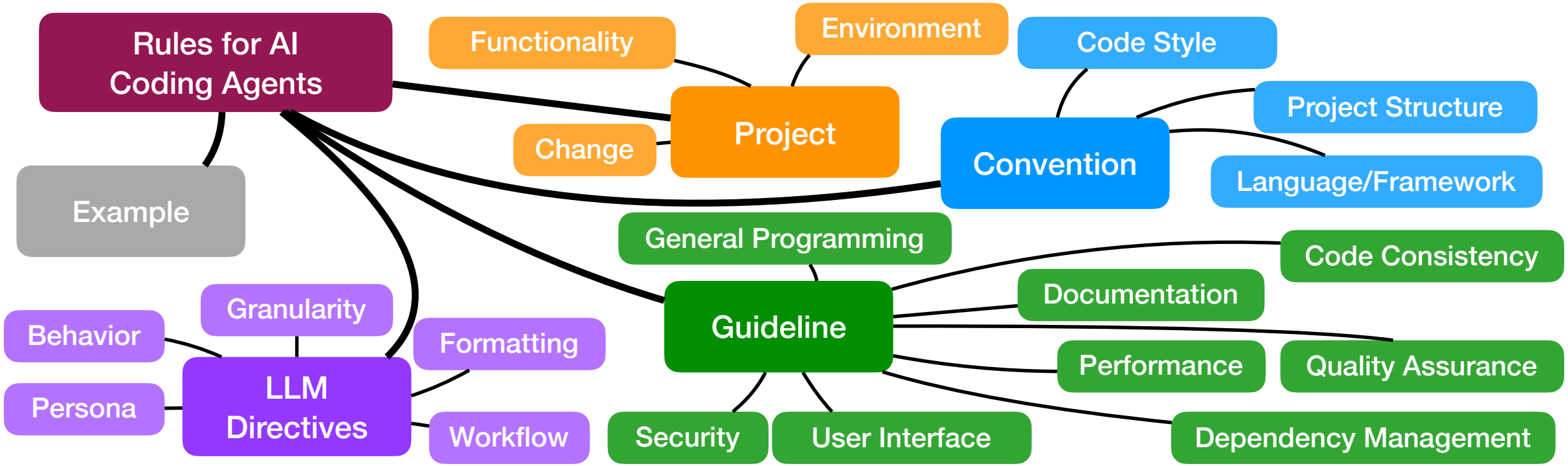


Taxonomy of Cursor Rule Information Types



Different Types of Information in Cursor Rules

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Project

Describes the software project of the repositories.

Different Types of Information in Cursor Rules

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How code should be written

Different Types of Information in Cursor Rules

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Rules for practices and pitfalls

- Always ask clarifying questions if context is missing
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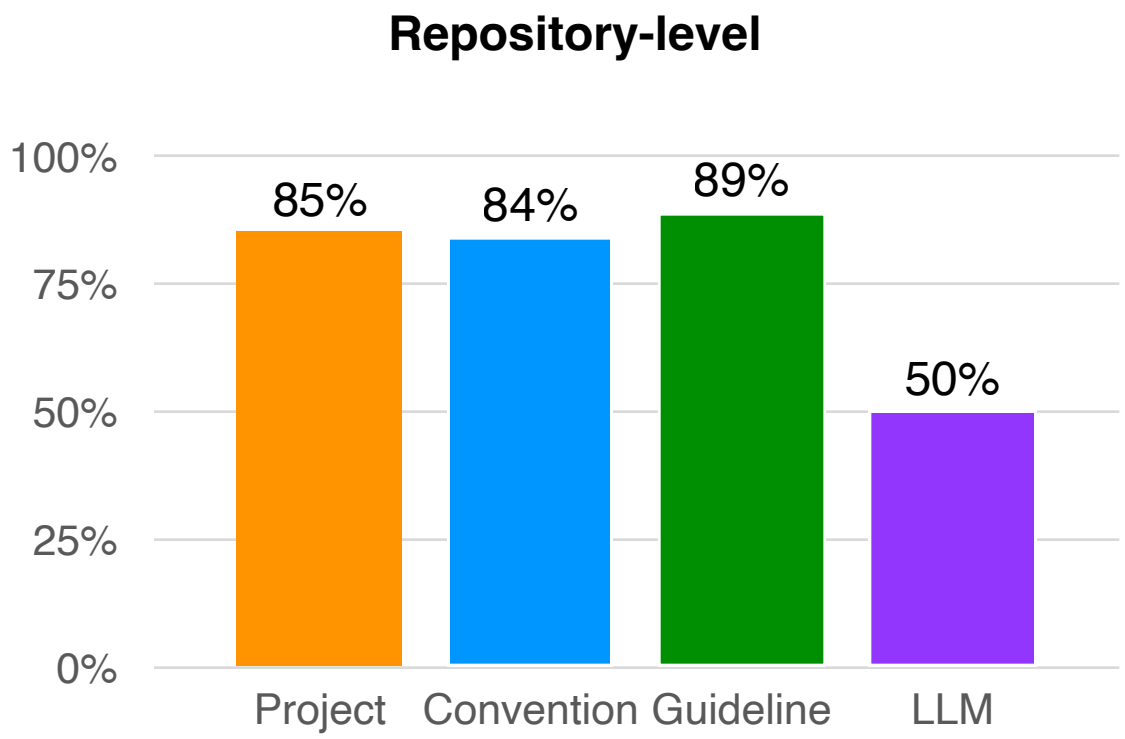
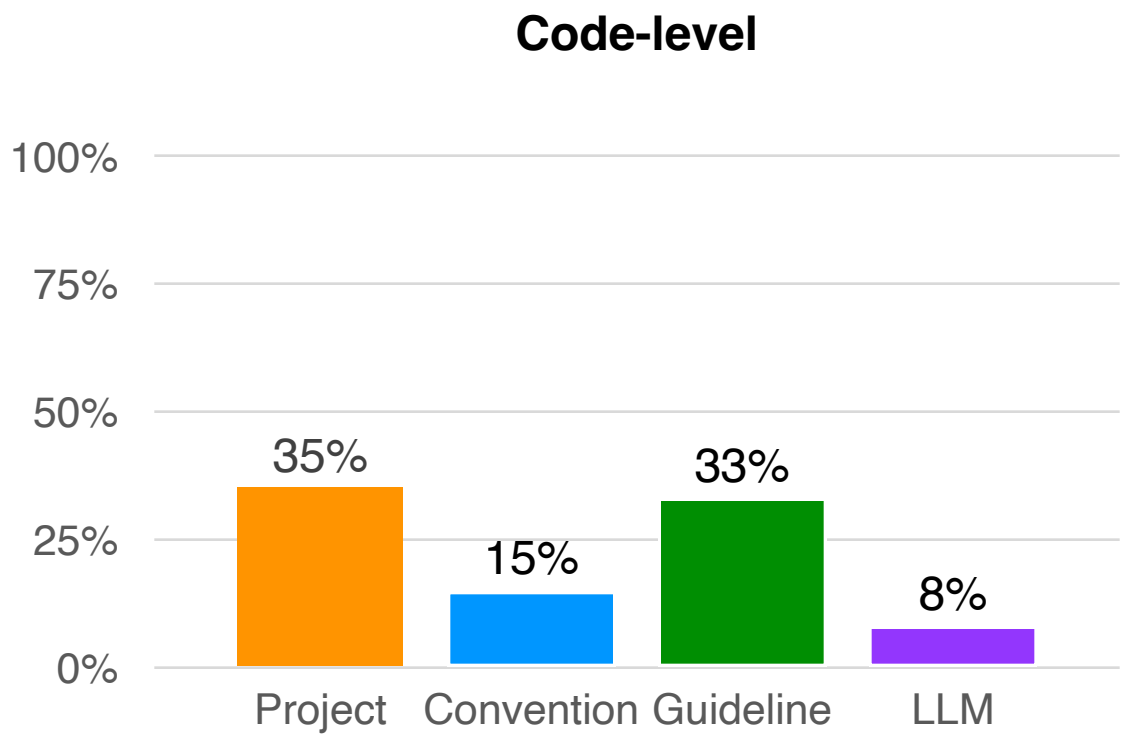
For LLMs on how to generate responses

Distribution of Information Types





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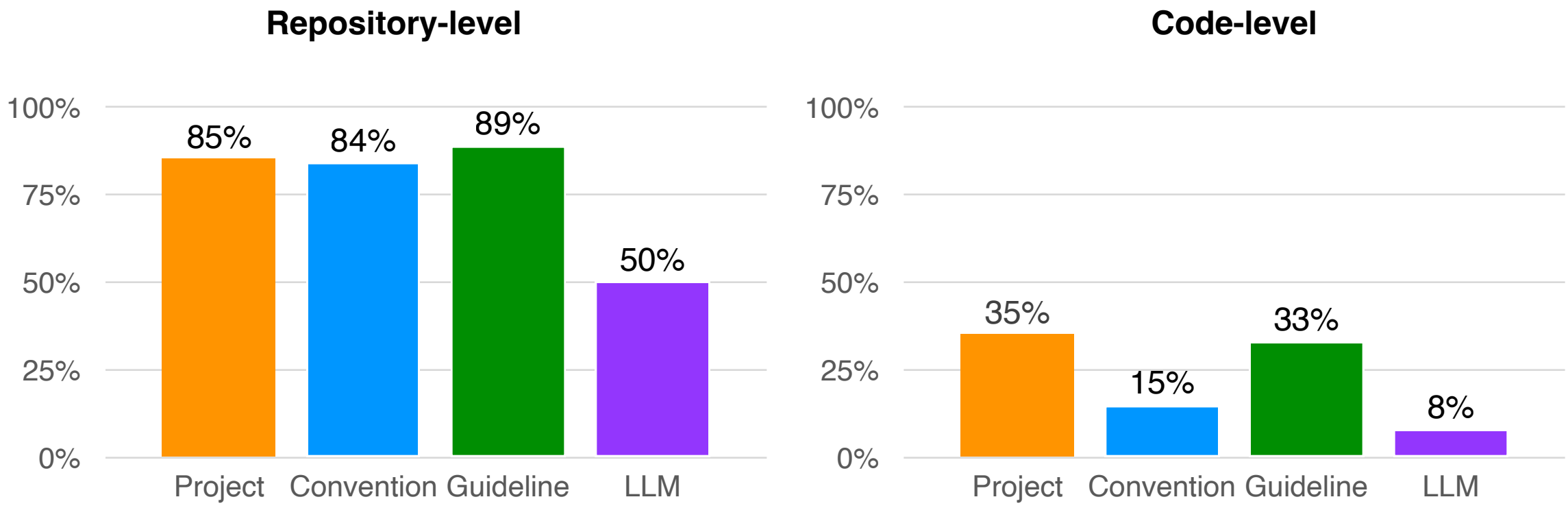
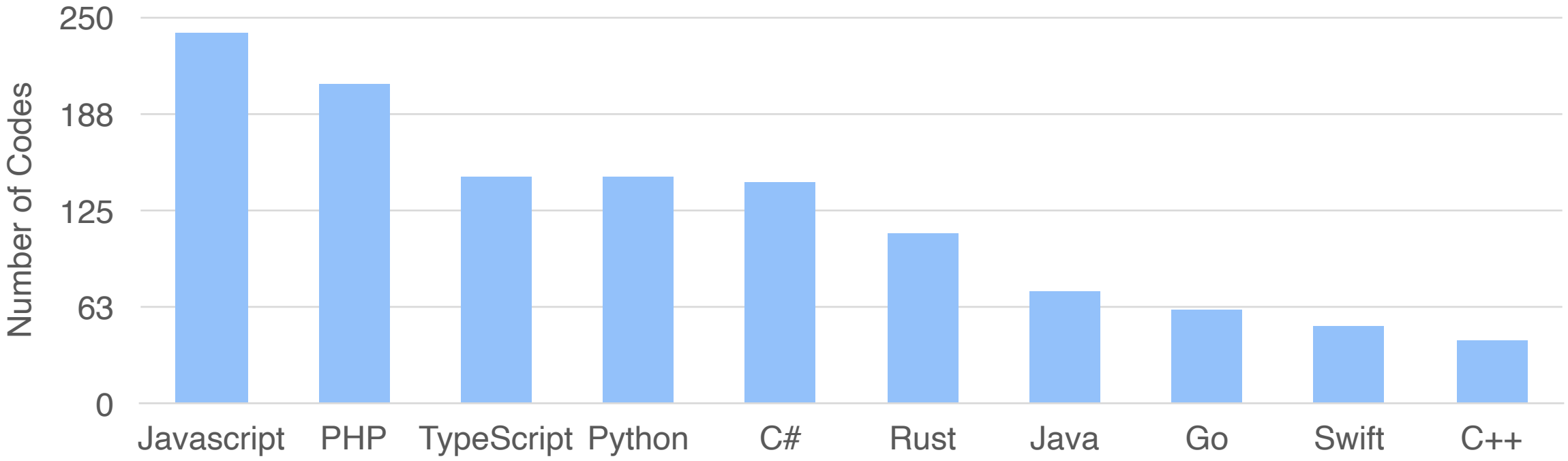


Cursor rules still mirror traditional project documentation, possibly because developers default to familiar documentation practices.

Variation in Rules Across PLs



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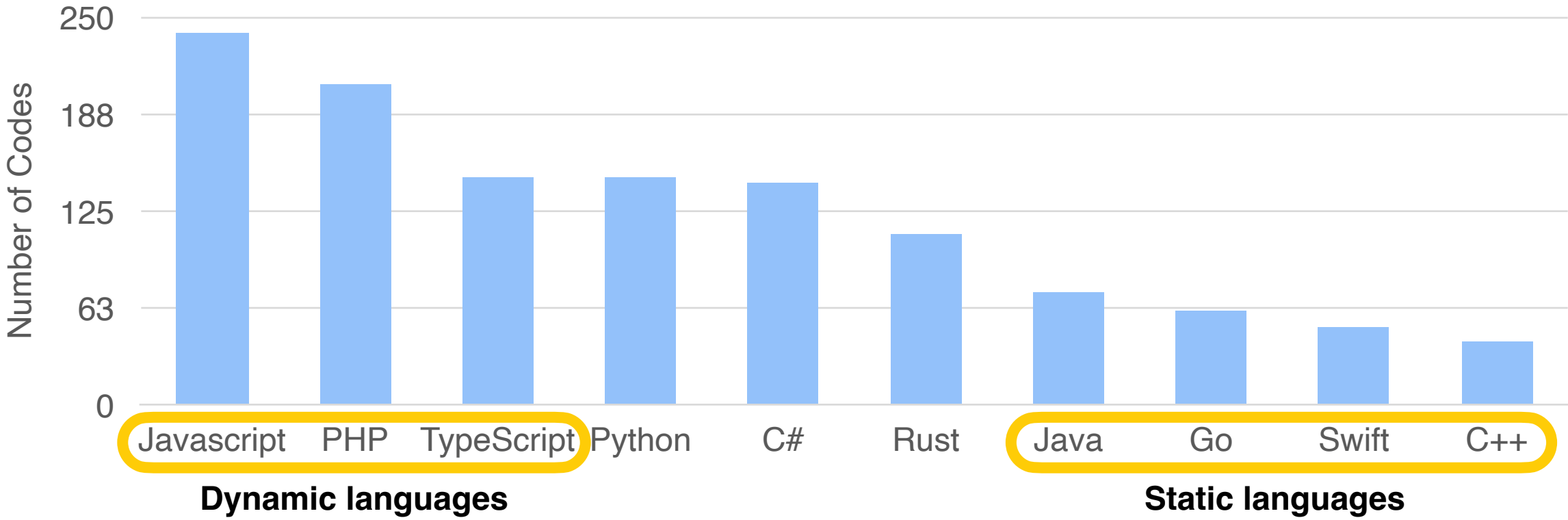

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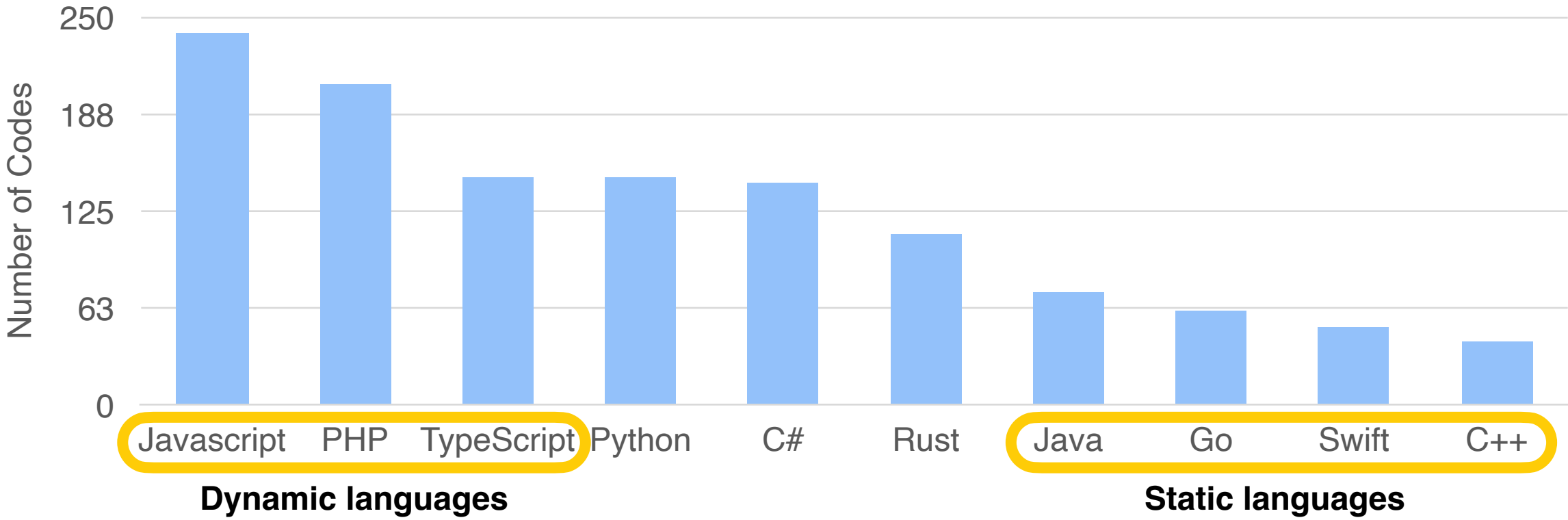

Rule/skill generation tools should tailor their output to the project's language and framework, rather than relying on generic templates

Developers Misunderstand Rule Semantics

performance-optimizer.mdc

```
triggers:
  - file.modified
  - pull_request.created
  - pull_request.updated
  - command: "optimize_performance"
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Performance Analysis Logic

```javascript
// Main function to analyze code for performance issues
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Tools should make transparent how rules are used and which rules are active for each task

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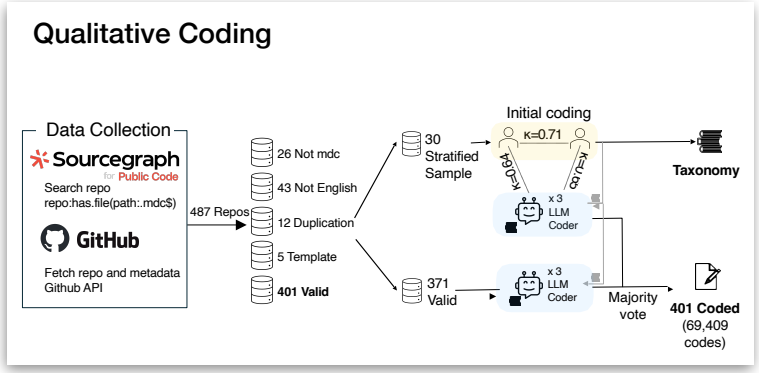

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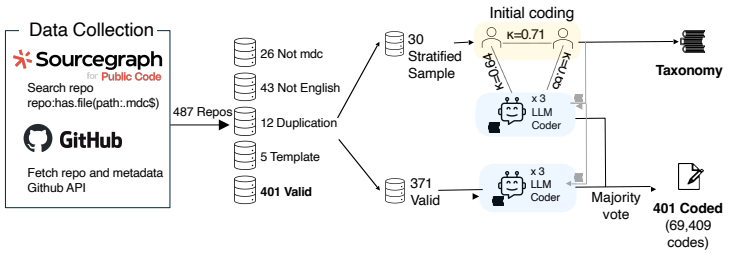
Qualitative Coding



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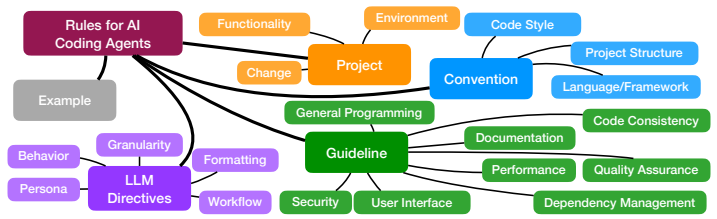

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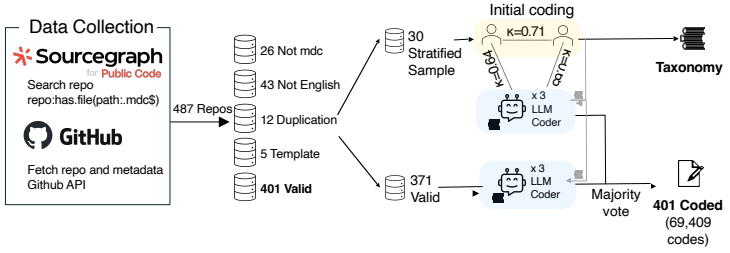

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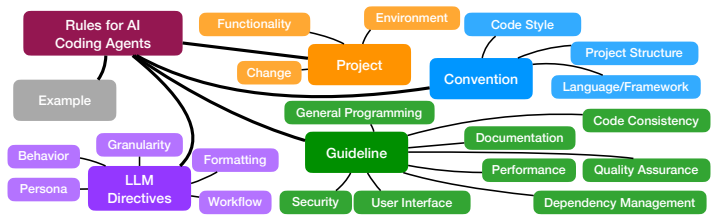

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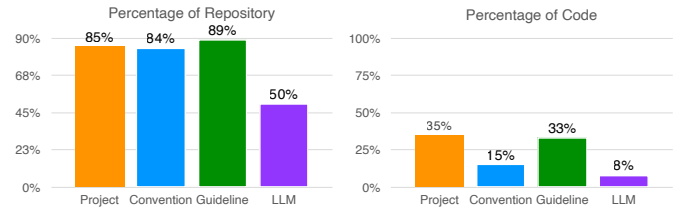

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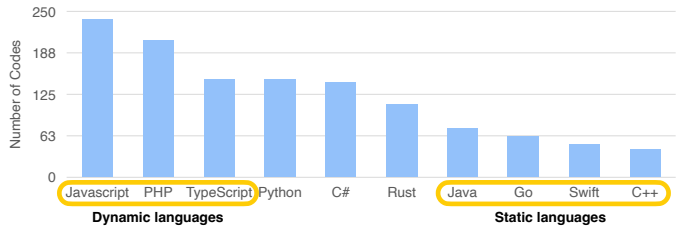

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Developers Misunderstand Rule Semantics

performance-optimizer.mdc

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## Rule Definition

This rule analyzes code changes for potential performance
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1) Future work should investigate which rule aspects are most effective,
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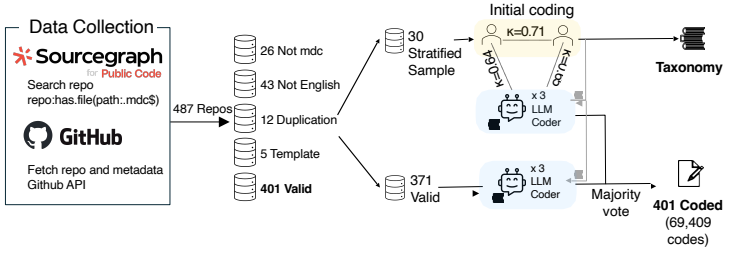

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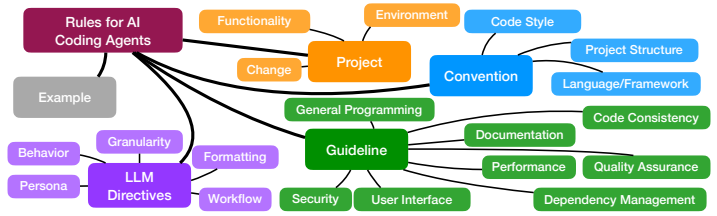

Full Paper

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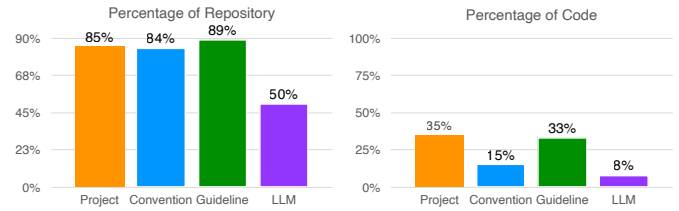

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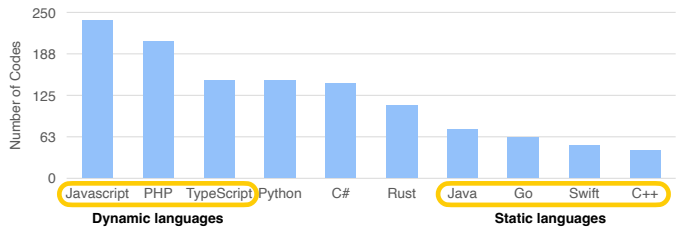

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