



PLAID: Supporting Computing Instructors to Identify Domain-Specific Programming Plans at Scale

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A programming plan is a template that highlights the goal of a common code pattern.

Motivation

Studies show plans can improve motivation [1], problem-solving skills [2]

But, they:

Have mostly been identified for introductory programming content

Are time-consuming and unclear to apply as an instructor

We propose:

Instructor-in-the-loop systems for interacting with LLMs can support this process.

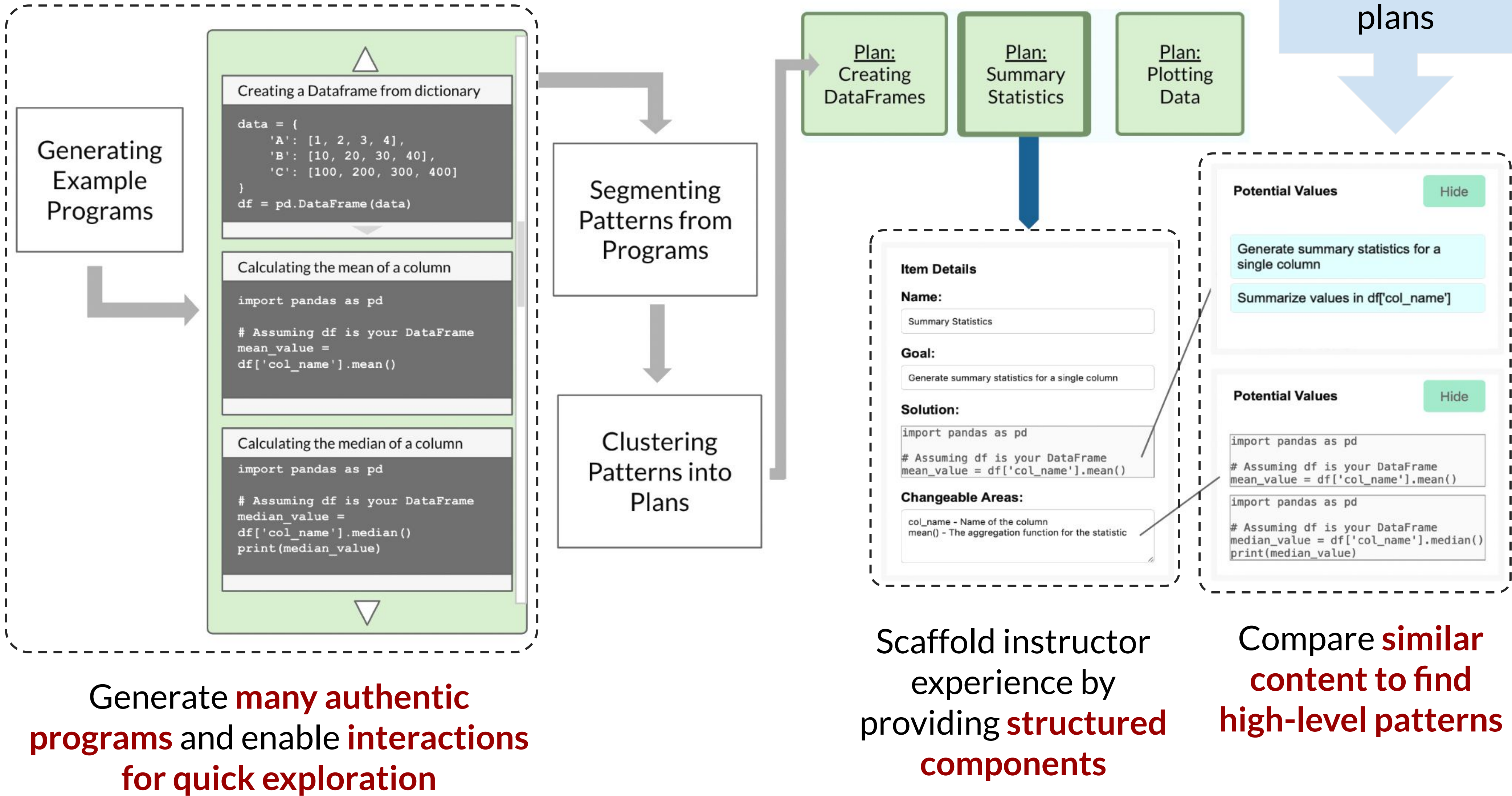
[1] K. Cunningham et al. "Avoiding the Turing Tarpit: Learning Conversational Programming by Starting from Code's Purpose."
[2] N. Weinman, A. Fox, and M. A. Hearst. 2021. Improving Instruction of Programming Patterns with Faded Parsons Problems. CHI '21.

PLAID enables using plan-based pedagogies in application-focused domains by presenting LLM-generated content and supporting interactions for its refinement.

Tedious for instructors to find plans from practice

Challenging to learn how to apply plan-based pedagogies

Difficult to identify the right level of abstraction in plans



Evaluation

Participants created more plans when using PLAID compared to the baseline condition.

Participants reported high scores on the PSSUQ usability survey.

Average task load for instructors was significantly lower with PLAID.

Takeaway

As part of instructor-in-the-loop systems, LLMs can automate repetitive work, allowing instructors to use their expertise to focus on refining content.