DSPy meets HELM

Structured Prompting Enables More Robust, Holistic Evaluation of Language Models

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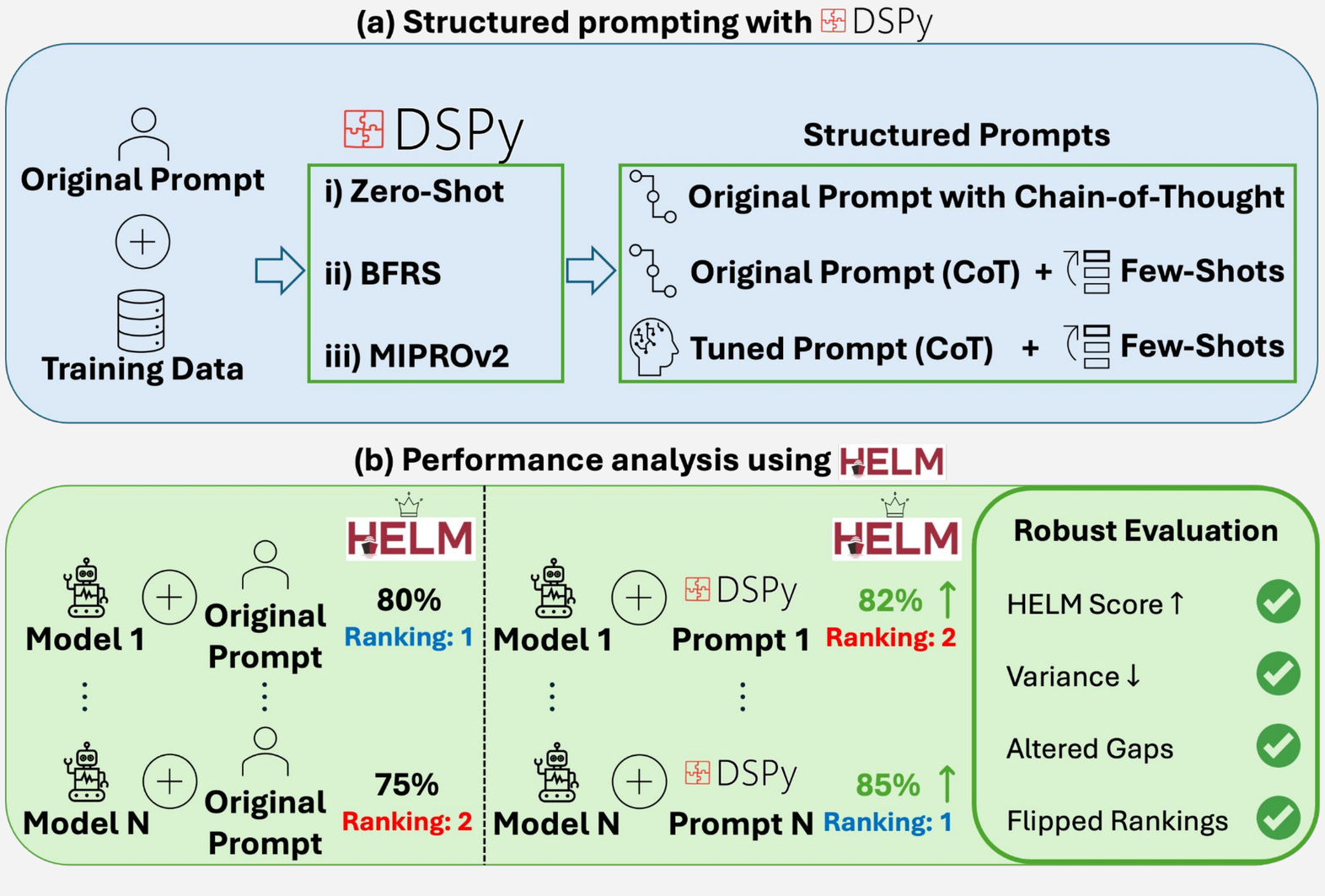
Paper

DSPy+HELM Pipeline



Structured Prompting Methods

Prompt 1: HELM Baseline

Given a patient note and a clinical question, compute the requested medical value.
Patient Note and Question: ————————————————————

Prompt 2: Zero-Shot CoT

Your input fields are: "INPUTS"
Your output fields are: "REASONING" and "OUTPUT"
Your objective is: Given the fields "INPUTS", produce the fields "OUTPUT"

INPUTS:

Given a patient note and a clinical question, compute the requested medical value.
Patient Note and Question: ————————————————————

Respond with the corresponding output fields, starting with "REASONING", then "OUTPUT".

Prompt 3: BFRS (Few-Shot Optimized)

Your input fields are: "INPUTS"
Your output fields are: "REASONING" and "OUTPUT"
Your objective is: Given the fields "INPUTS", produce the fields "OUTPUT"

IN-CONTEXT EXAMPLES (K Demos):

INPUTS: <input text> → REASONING: <steps>, OUTPUT: <output text>

INPUTS:

Given a patient note and a clinical question, compute the requested medical value.
Patient Note and Question: ————————————————————

Respond with the corresponding output fields, starting with "REASONING", then "OUTPUT".

Prompt 4: MIPROv2 (Instruction + Few-Shot Optimized)

Your input fields are: "INPUTS"
Your output fields are: "REASONING" and "OUTPUT"
Your objective is: You are a highly skilled medical expert working in a busy emergency room. A patient presents with a complex medical history and concerning symptoms. The attending physician needs your immediate assistance in calculating a critical risk score to guide treatment decisions. The patient's life may depend on your accuracy.

IN-CONTEXT EXAMPLES (K Demos):

INPUTS: <input text> → REASONING: <steps>, OUTPUT: <output text>

INPUTS:

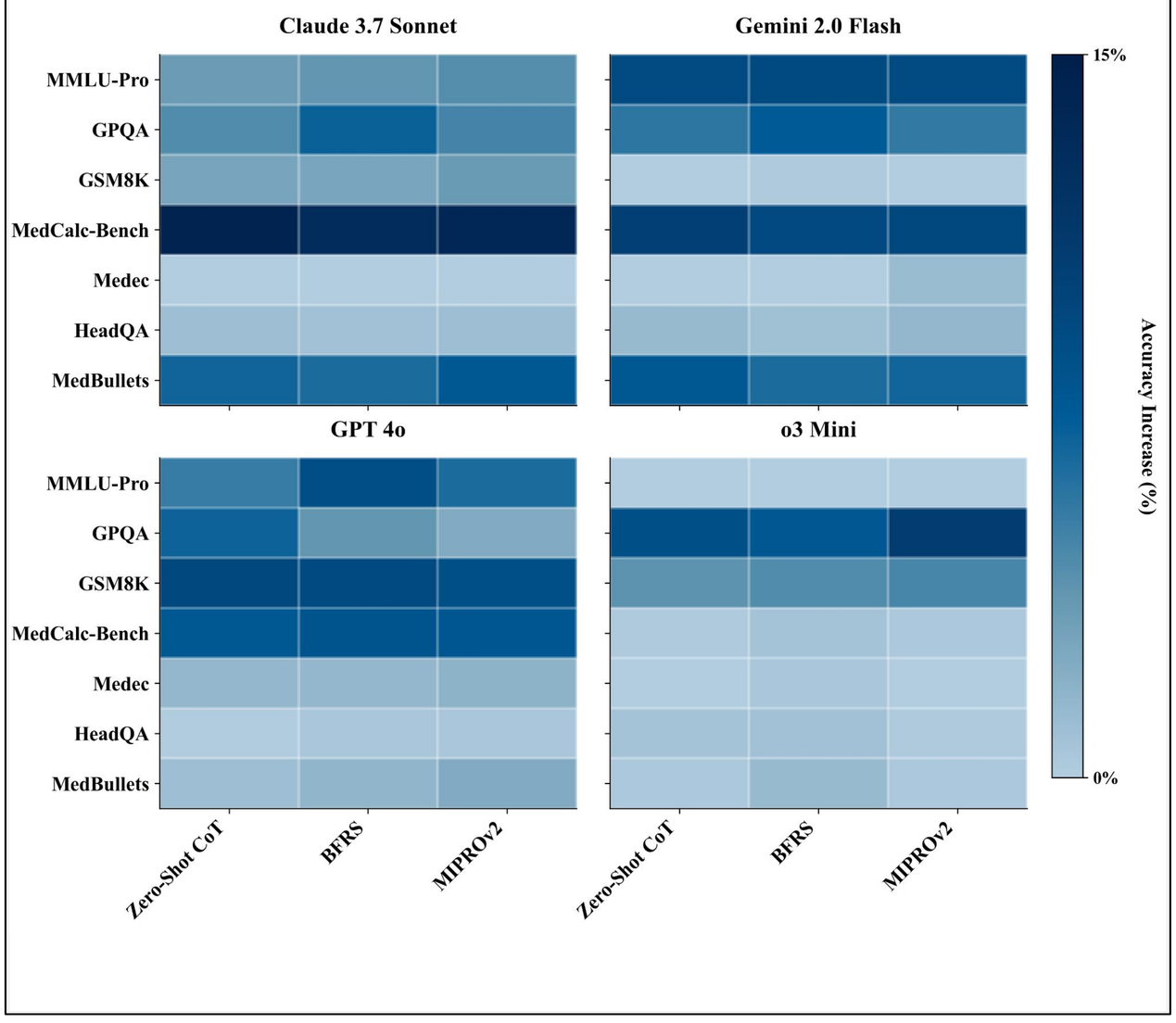
Given a patient note and a clinical question, compute the requested medical value.
Patient Note and Question: ————————————————————

Respond with the corresponding output fields, starting with "REASONING", then "OUTPUT".

HELM Leaderboard (Macro-Averaged)

Prompting Method	Claude 3.7 Sonnet	Gemini 2.0 Flash	GPT 4o	o3 Mini
HELM Baseline	64.81% ± 22.6	61.41% ± 23.8	61.04% ± 23.9	70.93% ± 19.7
Zero-Shot Predict	65.10% ± 22.6	61.69% ± 22.7	59.69% ± 25.0	**73.24% ± 20.3**
Zero-Shot CoT	69.36% ± 18.8	**66.21% ± 20.9**	65.67% ± 22.5	72.73% ± 19.7
BFRS	69.34% ± 19.0	66.19% ± 21.2	**65.87% ± 22.9**	73.07% ± 19.7
MIPROv2	**69.80% ± 19.0**	66.19% ± 21.1	65.34% ± 23.0	73.07% ± 19.6
Ceiling − Baseline (Δ)	+4.99%	+4.80%	+4.83%	+2.31%

Increase in Accuracy over HELM Baseline



Accuracy vs Cost Tradeoff