AI ASSISTANT CODING
ASSIGNMENT-3.5

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Batch: 34
Semester: VI
Branch: CSE(AIML)

Lab 3: Prompt Engineering: Improving prompt and context management

Objective: To explore how variations in prompt structure affect the quality, completeness, and accuracy of responses from a large language model.

Requirements:

- **VS Code with GitHub Copilot or Cursor API and/or Google Colab with Gemini**
- **Tasks to be completed are as below.**

Task 1: Conceptual Understanding in

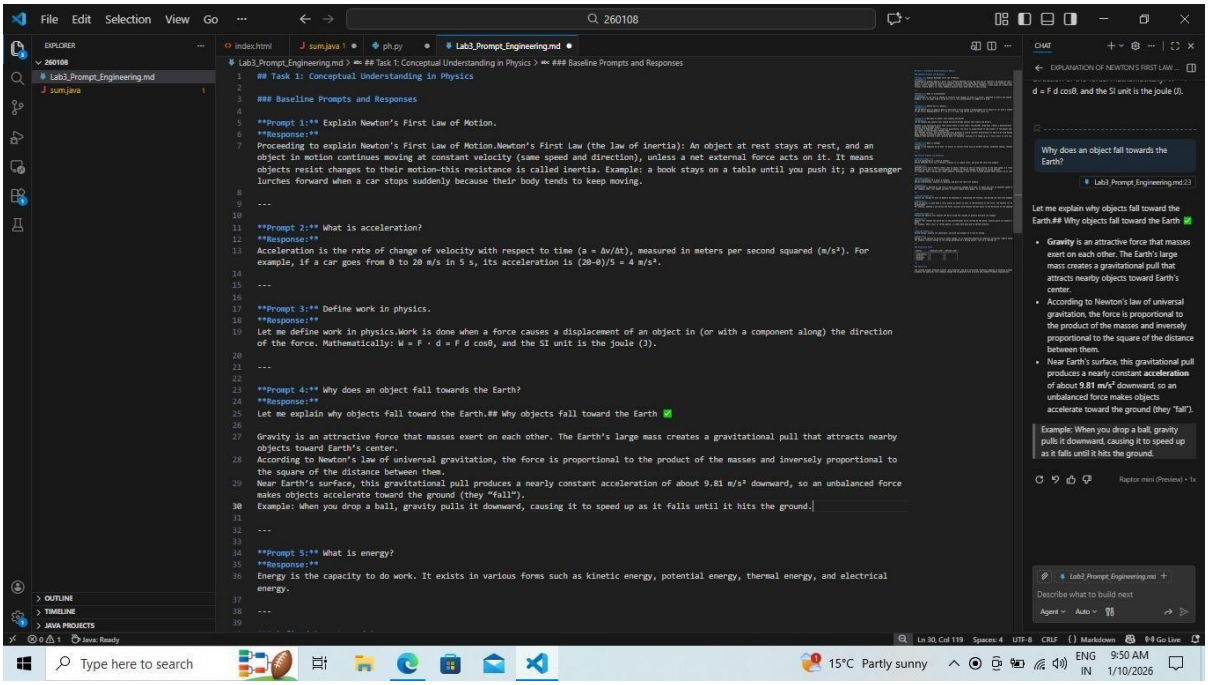
Physics Scenario
Suppose that you are a data assistant developer for an EdTech company that uses ChatGPT to answer student queries related to introductory physics.

Tasks to be completed

1. Baseline Prompt Testing
Choose 5 typical user queries, for example:

"Explain, What, Define, Why, What"

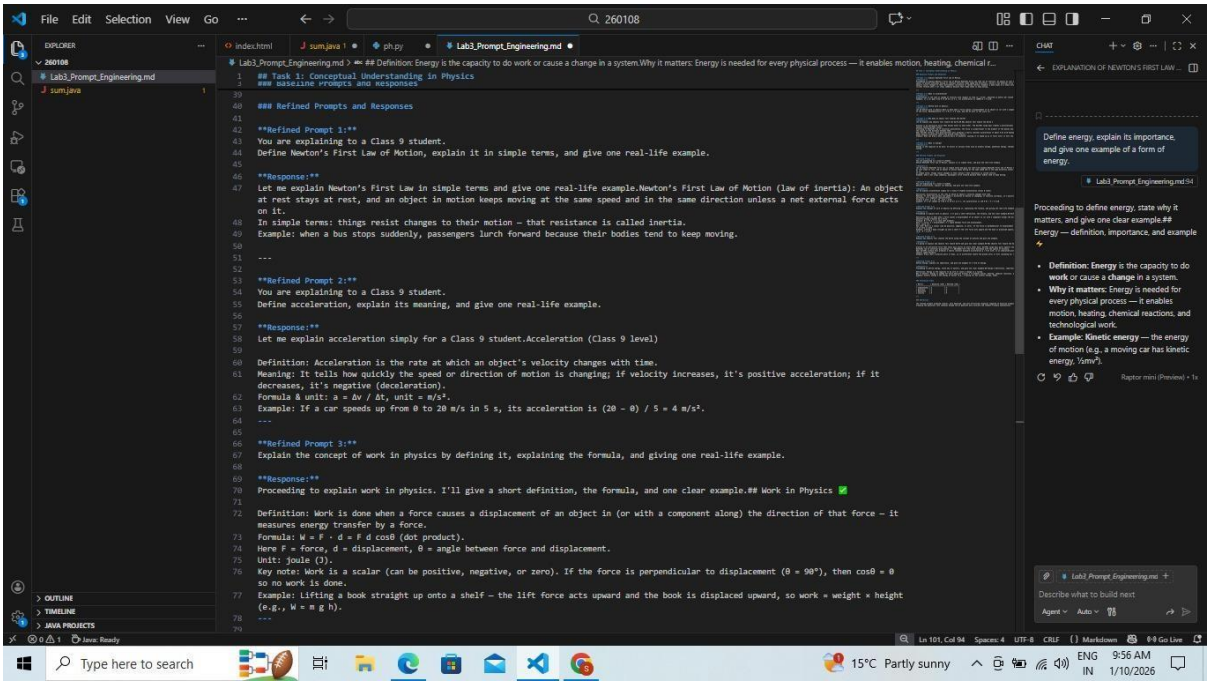
- **Run these prompts in a chat-based AI model and record the raw responses.**



2. **Prompt Refinement**

Rewrite each query using the following strategies:

- **Add 5 different contexts (school level, competitive exam, real-life application, mathematical focus, conceptual focus).**
- **Make the task explicit (e.g., "List and explain Newton's three laws with one real-world example each.").**
- **Break the query into subtasks (definition → explanation → example). Run these prompts in a chat-based AI model and record the raw responses.**



2. Evaluate Outputs

Score AI responses on a scale of 1–5 using:

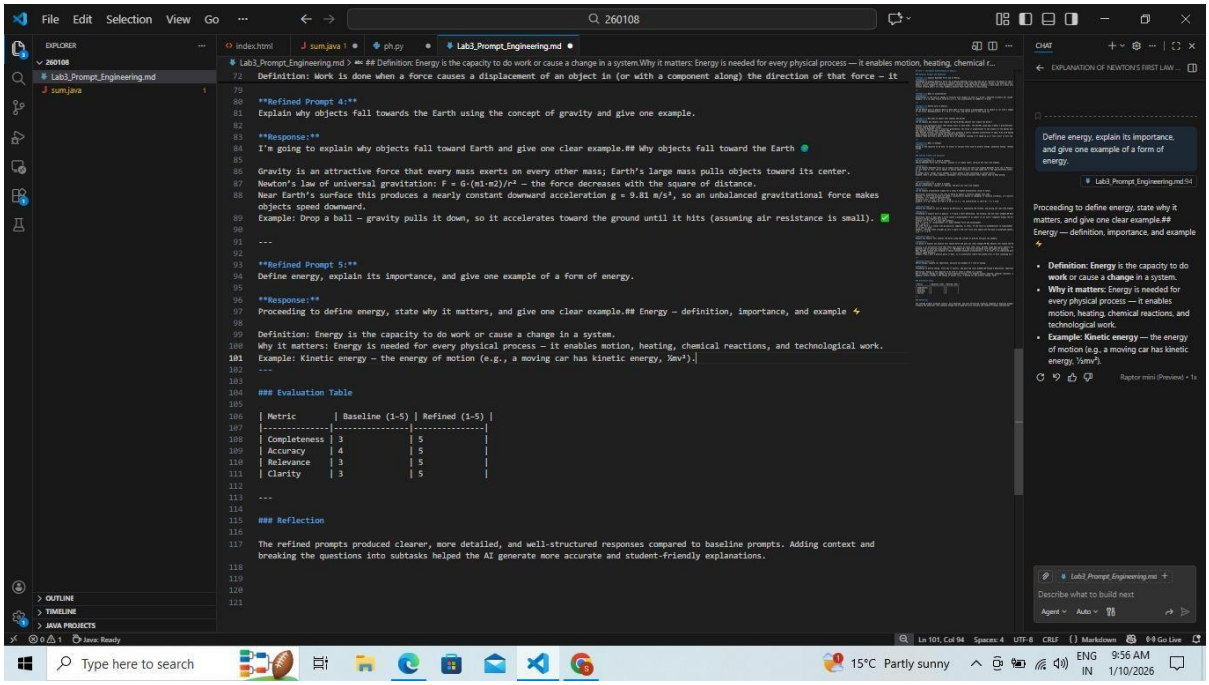
- **Completeness**
- **Accuracy**
- **Relevance**
- **Clarity**

Run these prompts in a chat-based AI model and record the raw

responses. Present results in a comparative table.

3. Reflection

Discuss how contextual and structured prompts influenced the depth and correctness of Responses.



Task 2: Programming Fundamentals Python

Scenario

Suppose that you are a data assistant developer for an EdTech platform that supports beginner programming students.

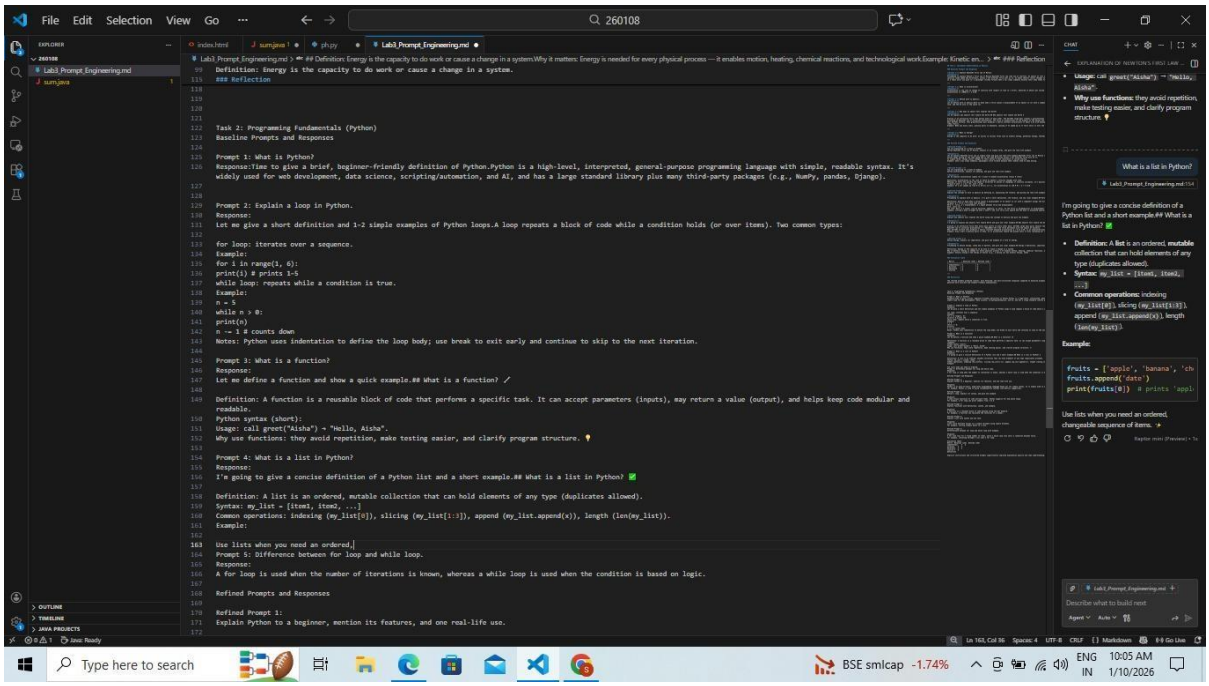
Tasks to be completed

1. Baseline Prompt Testing

Choose 5 common user queries, such as:

- **"What, Explain, How, What, Difference"**

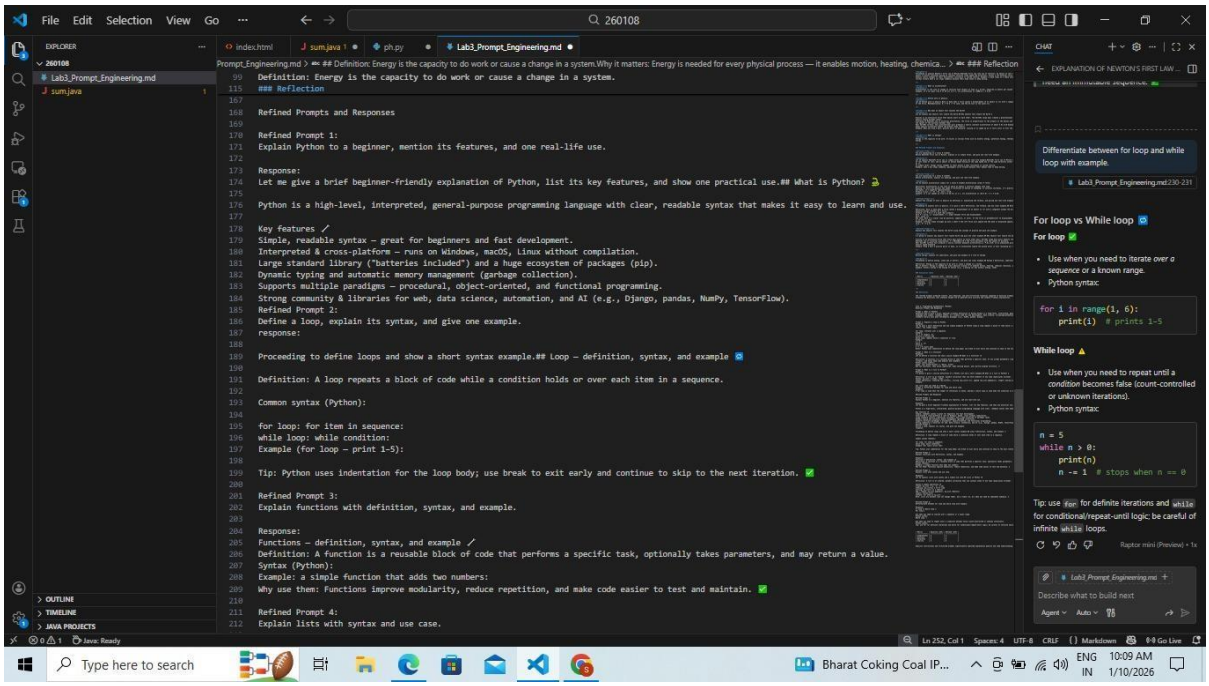
Run these prompts in a chat-based AI model and record the raw responses.



2. Prompt Refinement
Rewrite each query by:

- **Adding 5 contexts (beginner, exam-oriented, real-world analogy, syntax-focused, performance-focused).**
- **Making instructions explicit (e.g., "Define a Python loop and show one example for for-loop and while-loop.").**
- **Breaking into subtasks (definition → syntax → example → use case).**

Run these prompts in a chat-based AI model and record the raw responses.

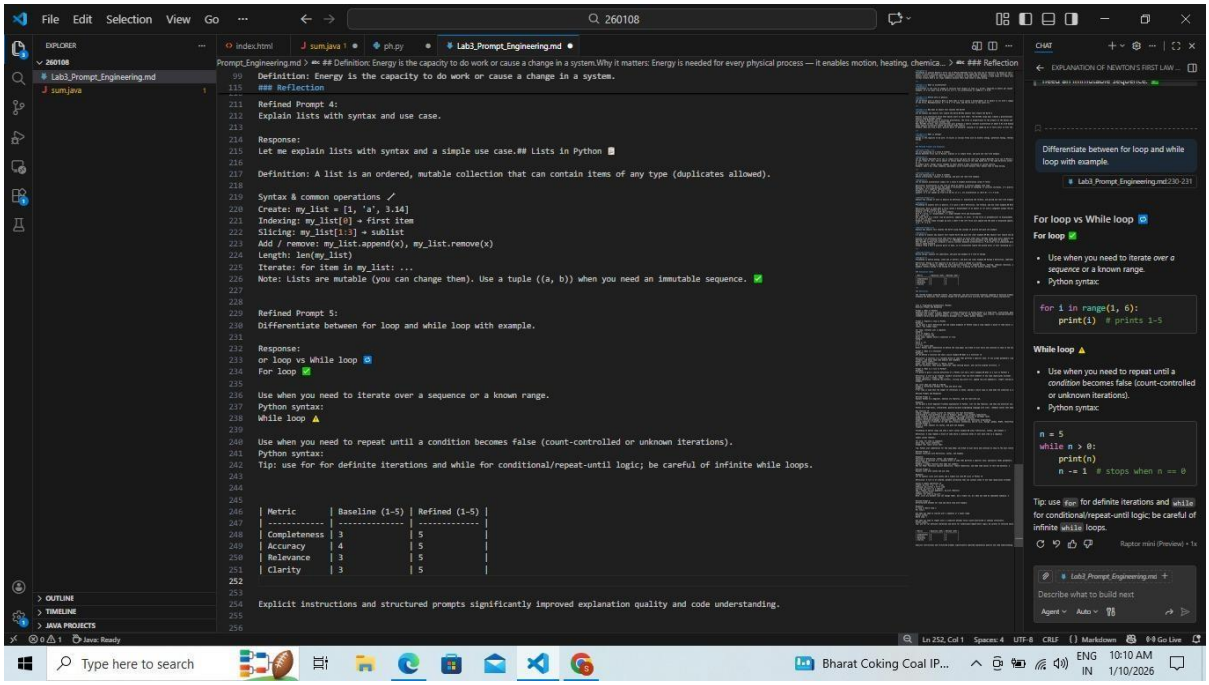


3. Evaluate Outputs

- **Evaluate responses using completeness, accuracy, relevance, and clarity.**
- **Summarize findings in a table.**

4. Reflection

Analyze, how explicit subtasks improve code correctness and explanation quality.



Task 3: Data Science and Machine Learning Concepts

Scenario

Suppose that you are a data assistant developer for an EdTech company offering data science courses.

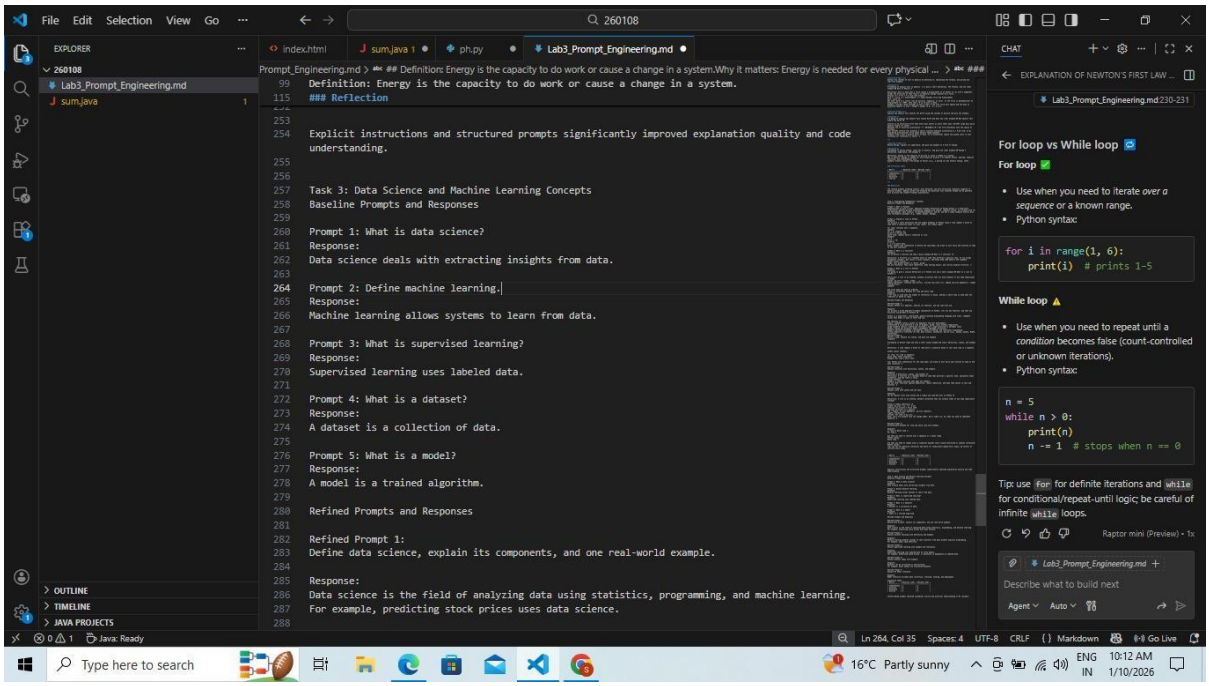
Tasks to be completed

1. Baseline Prompt Testing

Select 5 typical queries, for example:

- **“What, Explain, What, Define, What”**

Run these prompts in a chat-based AI model and record the raw responses.

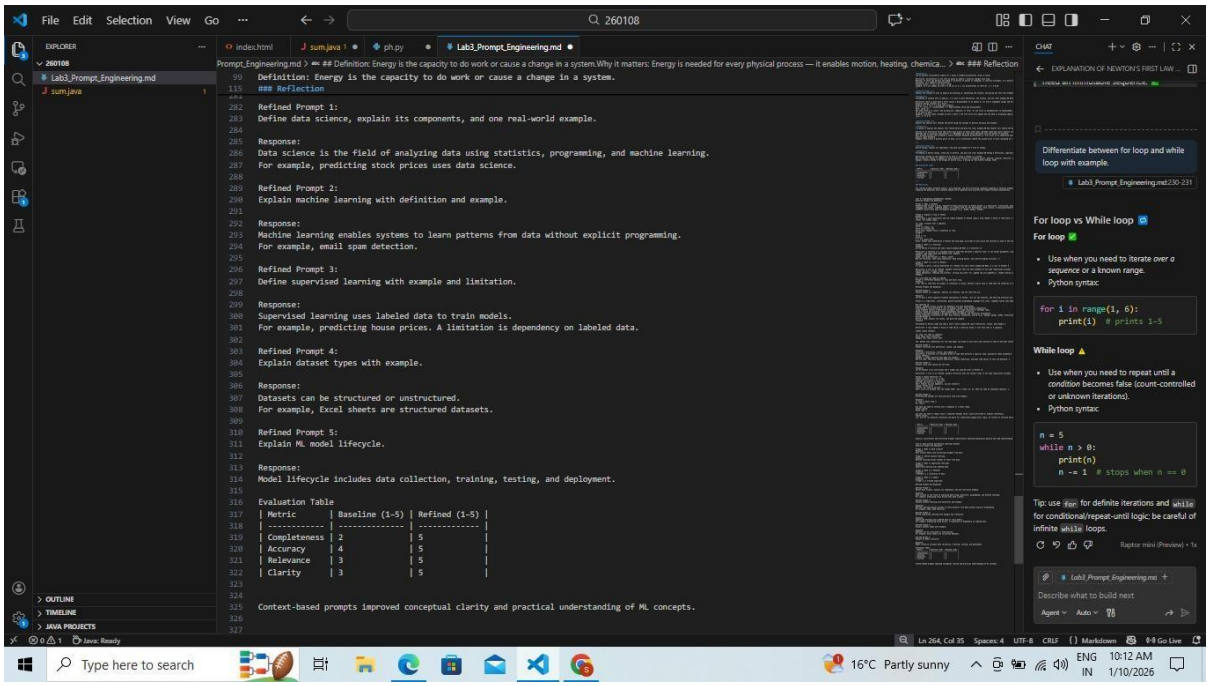


2. Prompt Refinement Refine each query by:

- **Adding 5 contexts (academic, industry, beginner-friendly, mathematical, interview- focused).**
- **Making tasks explicit (e.g., "Define supervised learning and explain it with one real-world example.").**
- **Breaking into subtasks (definition → types → example → limitation). Run these prompts in a chat-based AI model and record the raw responses.**

3. Evaluate Outputs
Score outputs using the given metrics and present results in a table.

4. Reflection
Reflect on how context management affects conceptual clarity in technical domains.



Task 4: Database and SQL Queries

Scenario

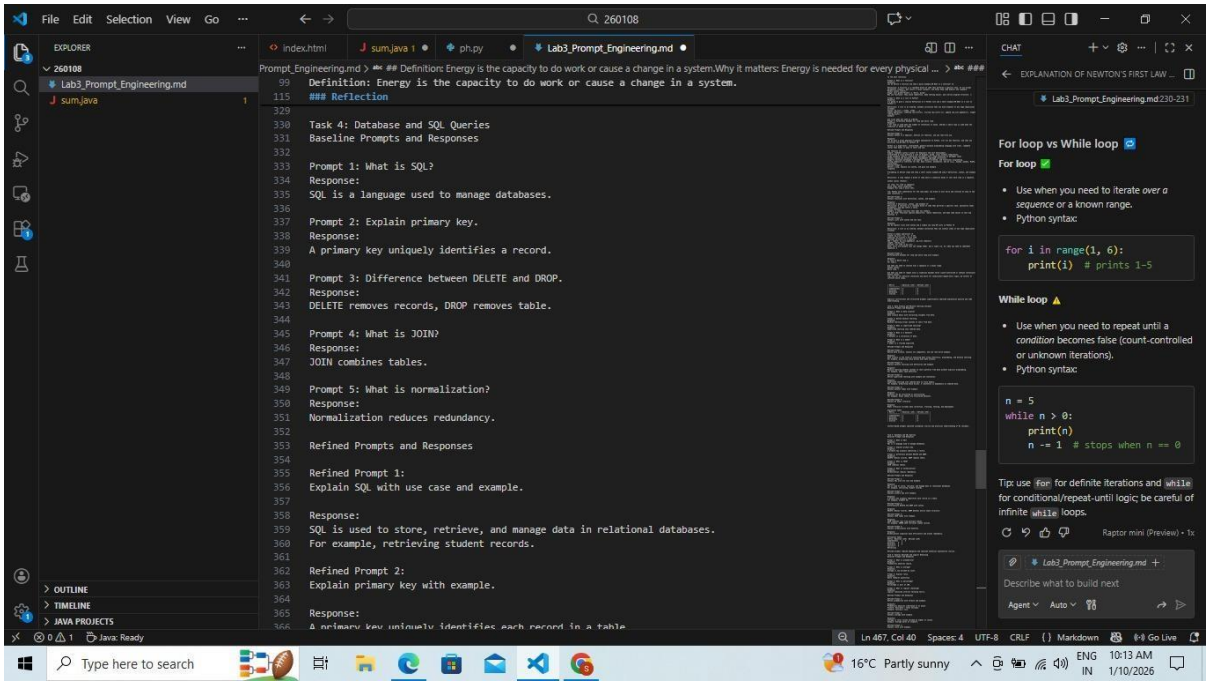
Suppose that you are a data assistant developer supporting students learning database systems. Tasks to be completed

1. Baseline Prompt Testing

Choose 5 common queries, such as:

- **“Explain, What, Difference, where, how”**

Run these prompts in a chat-based AI model and record the raw responses.



2. Prompt Refinement
Rewrite each prompt by:

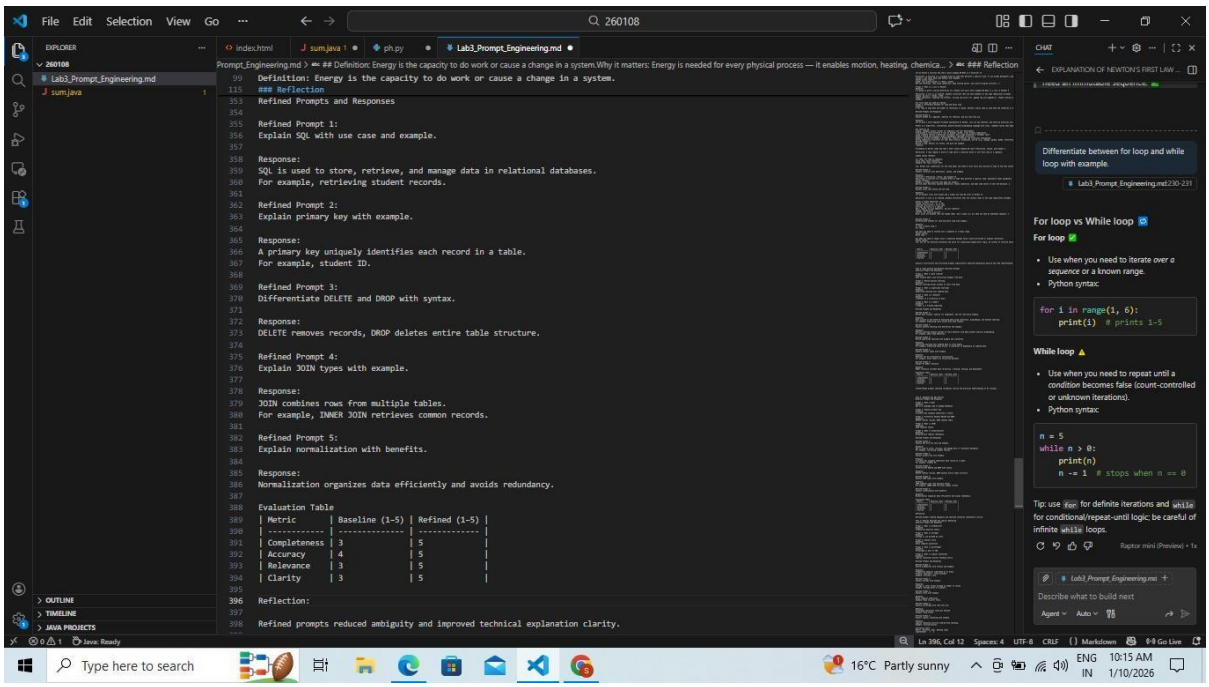
- **Adding 5 contexts (theory exam, practical lab, interview prep, real-world database, optimization focus).**
- **Making instructions explicit (e.g., "Explain SQL JOIN types with syntax and examples.").**
- **Breaking into subtasks (definition → syntax → example → use**

case). Run these prompts in a chat-based AI model and record the

raw responses.

3. Evaluate Outputs
Evaluate responses using the four metrics and summarize results in a comparison table.

4. Reflection
Discuss how refined prompts reduce ambiguity in technical explanations.



Task 5: General Aptitude and Logical Reasoning

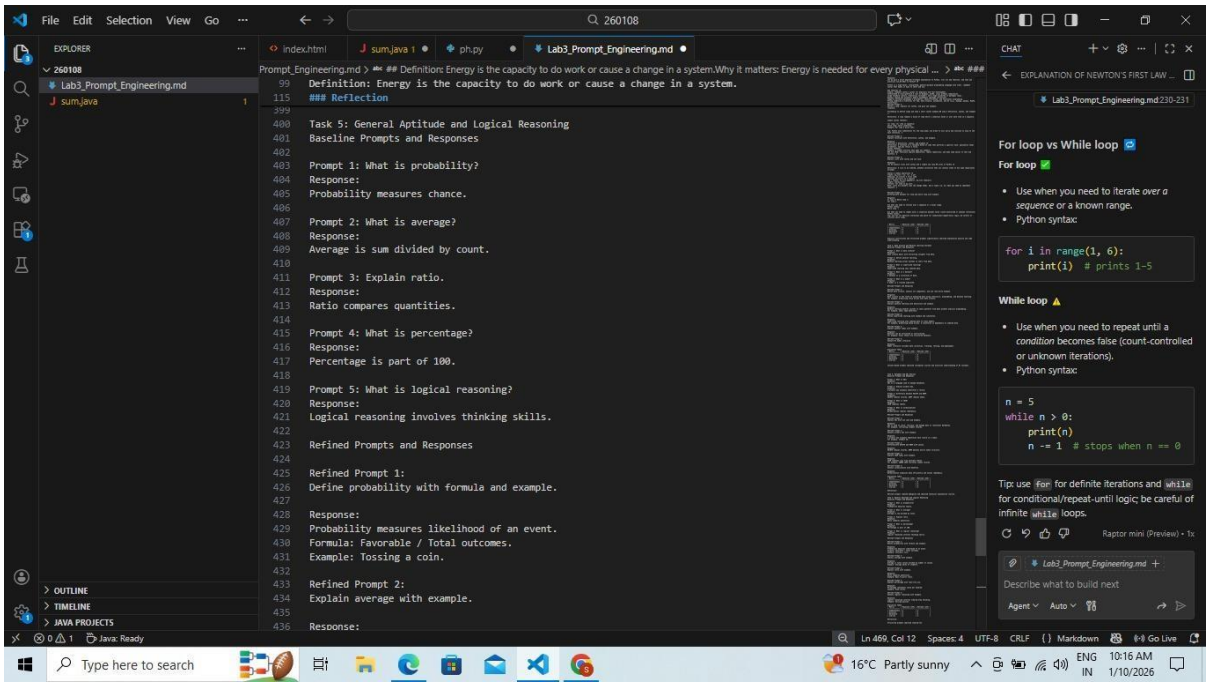
Scenario
Suppose that you are a data assistant developer for an EdTech company focused on aptitude and competitive exam preparation.

Tasks to be completed

1. Baseline Prompt Testing
Select 5 user queries, for example:

- **"Explain, What, Difference, where, how"**

Run these prompts in a chat-based AI model and record the raw responses.



2. Prompt Refinement
Rewrite each query by:

- **Adding 5 contexts (school exams, competitive exams, real-life analogy, formula-based, step-by-step solving).**
- **Making tasks explicit (e.g., "Define probability and solve one simple numerical example.").**
- **Breaking into subtasks (definition → formula → example → common mistakes).**

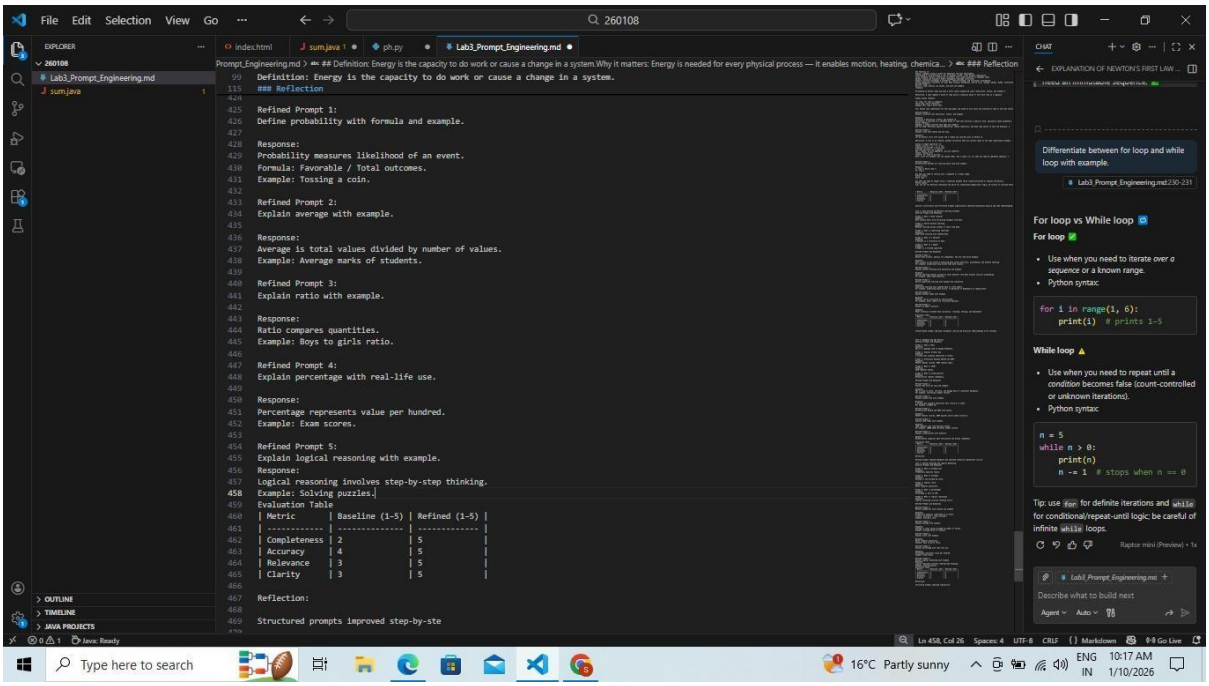
Run these prompts in a chat-based AI model and record the raw responses.

3. Evaluate Outputs

- **Score responses using completeness, accuracy, relevance, and clarity.**
- **Present findings in a table.**

4. Reflection

Reflect on how structured prompts improve step-by-step reasoning and learner understanding.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EXPLORER
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Lab3_Prompt_Engineering.md
sum.java
index.html
sum.java 1
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Lab3_Prompt_Engineering.md
Definition: Energy is the capacity to do work or cause a change in a system.
Reflection
Refined Prompt 1:
Define probability with formula and example.
Response:
Probability measures likelihood of an event.
Formula: Favorable / Total outcomes.
Example: Tossing a coin.
Refined Prompt 2:
Explain average with example.
Response:
Average is total values divided by number of values.
Example: Average marks of students.
Refined Prompt 3:
Explain ratio with example.
Response:
Ratio compares quantities.
Example: Boys to girls ratio.
Refined Prompt 4:
Explain percentage with real-life use.
Response:
Percentage represents value per hundred.
Example: Exam scores.
Refined Prompt 5:
Explain logical reasoning with example.
Response:
Logical reasoning involves step-by-step thinking.
Example: Solving puzzles.
Evaluation Table
Metric	Baseline (1-5)	Refined (1-5)
Completeness	2	5
Accuracy	4	5
Relevance	3	5
Clarity	3	5
Reflection:
Structured prompts improved step-by-ste
OUTLINE
TIMELINE
JAVA PROJECTS
CHAT
Differentiate between for loop and while loop with example.
For loop vs While loop
For loop
Use when you need to iterate over a sequence or a known range.
Python syntax:
for i in range(1, 6):
print(i) # prints 1-5
While loop
Use when you need to repeat until a condition becomes false (count-controlled or unknown iterations).
Python syntax:
n = 5
while n > 0:
print(n)
n -= 1 # stops when n == 0
Tip: use for for definite iterations and while for conditional/repeat-until logic; be careful of infinite while loops.
Describe what to build next
Agent
Auto
Type here to search
16°C Partly sunny
ENG
IN
10:17 AM
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