(AIAC)Lab Assignment 3. 6

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Batch-12

Task-1:

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. **Prompt:**

1. Explain Newton's laws of motion. 2.What is force? 3.Define inertia. 4.Why does an object stop moving?

5. What is acceleration?

Code:

Output:

Explanation:

These prompts guide you to explore key concepts in physics related to motion. They ask you to explain Newton's laws, which describe how forces affect movement, and to define force itself as a push or pull that changes an object's state. You're also asked to define inertia, the tendency of objects to resist changes in their motion. The prompts encourage you to think about why objects stop moving, often due to forces like friction.

Task 2:

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).

Prompt:

1.What is a loop in Python? 2.Explain lists in Python. 3.How does a function work?

4.What is the difference between list and tuple?

5.What is Python?

Code:

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Task 2
#What is a loop in Python in points.
1.A loop in Python is a control structure that allows you to execute a block of code multiple times.
2.Python primarily has two types of loops: 'for' loops and 'while' loops.
3.A 'for' loop is used to iterate over a sequence (like a list, tuple, or string) or other iterable objects.
4.A 'while' loop continues to execute as long as a specified condition is true.

#Explain lists in Python in points.
1.A list in Python is a built in data type that can store a collection of items.
2.Lists are ordered, meaning the items have a defined order, and this order will not change unless explicitly modified.
3.Lists are mutable, which means you can change, add, or remove items after the list has been created.
4.Lists can contain items of different data types, including other lists, making them versatile for various applications.

#How does a function work in points.
1.A function in Python is a reusable block of code that performs a specific task.
2.Functions are defined using the 'def' keyword followed by the function name and parentheses.
3.Functions can take input parameters (arguments) to work with different data.
4.Functions can return a value using the 'return' statement, allowing the result to be used elsewhere in the program.

#What is the difference between list and tuple in points.
1.Mutability: Lists are mutable, meaning their elements can be changed, added, or removed. Tuples are immutable, so once they are created, their elements cannot be modified.
2.Syntax: Lists are defined using square brackets [] (e.g., my_list = [1, 2, 3]), while tuples are defined using parentheses () (e.g., my_tuple = (1, 2, 3)).
3.Performance: Tuples are generally faster than lists for certain operations due to their immutability, making them more efficient for read-only data.

#What is python in points.
1.Python is a high level, interpreted programming language known for its readability and simplicity.
2.It supports multiple programming paradigms, including procedural, object oriented, and functional programming.
3.Python has a large standard library and a vast ecosystem of third-party packages, making it suitable for various applications such as web development, data analysis, artificial intel
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**Rewrote the prompts for prompt refinement:**

#What is a loop in Python in beginner level in points.
1.A loop in Python is a way to repeat a block of code multiple times.
2.There are two main types of loops in Python: 'for' loops and 'while' loops.
3.A 'for' loop is used to go through each item in a list or other collection.
4.A 'while' loop keeps running as long as a certain condition is true.

#explain lists in Python in Exam Oriented points.
1.A list in Python is a collection of items that are ordered and changeable.
2.Lists are defined using square brackets [] and can contain items of different data types.
3.Lists allow duplicate values, meaning the same item can appear multiple times.
4.Common list operations include adding, removing, and accessing items using indexing.

#How does a function work in Real world Analogy points.
1.A function is like a recipe in a cookbook; it provides a set of instructions to perform a specific task.
2.You define a function by giving it a name and specifying the ingredients (parameters) it needs to work with.
3.When you want to use the function, you "call" it by its name and provide the necessary ingredients (arguments).
4.The function processes the ingredients and returns a finished dish (output) that you can use.

#What is the difference between list and tuple in Syntax focuses in points.
1.Lists are created using square brackets [] (e.g., my_list = [1, 2, 3]), while tuples are created using parentheses () (e.g., my_tuple = (1, 2, 3)).
2.Lists are mutable, meaning you can change their contents after creation, whereas tuples are immutable and cannot be changed once created.
3.Lists allow for dynamic resizing, so you can add or remove items, while tuples have a fixed size.
4.Both lists and tuples can store multiple data types, but tuples are often used for fixed collections of items.

#What is python in points for performance focus.
1.Python is an interpreted language, which means code is executed line by line, making it slower than compiled languages like C or Java.
2.Python's simplicity and readability often lead to faster development times, despite its slower execution speed.
3.Python has various implementations (like CPython, PyPy) that can improve performance for specific use cases.
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Output:

Explanation:

These prompts are designed to help you understand basic Python programming concepts. They ask you to explain what a loop is, which is a way to repeat actions in code. You're also asked to describe lists, which are collections of items that can be changed. The prompts include explaining how functions work, meaning reusable blocks of code that perform specific tasks. You're encouraged to compare lists and tuples, noting that lists are mutable while tuples are immutable. Finally, you're asked to define Python itself, which is a popular, high-level programming language known for its simplicity and versatility.

Task 3:

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).

Prompt:
1.What is machine learning? 2. Explain supervised learning. 3.Define overfitting. 4.What is regression? 5.What is classification?

Code:

Output:

Parameter	Original AI Responses	Rewritten Prompts
Completeness	5	5
Accuracy	5	5
Relevance	5	5
Clarity	4	5

Summary:

- **Completeness:** Both sets fully address each concept with all key points included.
- **Accuracy:** Both are factually correct and use appropriate terminology.
- **Relevance:** Both are relevant, but the rewritten prompts are more tailored to specific contexts (academic, industry, beginner, mathematical, interview).
- **Clarity:** The rewritten prompts are clearer, using audience-focused language and context-specific explanations, making them easier to understand and more useful for their intended purpose.

Conclusion:

Both sets are strong, but the rewritten prompts are superior in clarity and contextual relevance, making them more effective for targeted learning and communication.

Explanation: These prompts focus on fundamental concepts in machine learning. They ask you to define machine learning, which is a field where computers learn from data to make predictions or decisions. You're prompted to explain supervised learning, a method where models are trained on labeled data. The prompts include defining overfitting, which happens when a model learns the training data too well and performs poorly on new data. You're also asked to explain regression, a technique for predicting continuous values, and classification, which involves sorting data into categories. Each prompt helps you understand key ideas used in building and evaluating machine learning models.

Task 4:

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).

Prompt:

1.What is SQL? 2.Explain joins. 3.Difference between WHERE and HAVING. 4.How does indexing work?

5.What is normalization?

Code:

Output:

Parameter	Original AI Responses	Rewritten Prompts
Completeness	5	5
Accuracy	5	5
Relevance	5	5
Clarity	4	5

Summary:

- **Completeness:** Both sets fully address each topic with all key points included.
- **Accuracy:** Both are factually correct and use appropriate SQL/database terminology.
- **Relevance:** Both are relevant, but the rewritten prompts are more tailored to specific contexts (theory, lab, interview, real-world, optimization).
- **Clarity:** The rewritten prompts are clearer, with more context-specific language and explanations, making them easier to understand and more useful for their intended audience.

Conclusion:

Both sets are strong, but the rewritten prompts are superior in clarity and contextual relevance, making them more effective for targeted learning and communication.

Explanation: These prompts are about key concepts in SQL and database management. They ask you to define SQL, which is a language used to manage and query databases. You're prompted to explain joins, which combine data from multiple tables based on related columns. The prompts include distinguishing between WHERE and HAVING clauses, where WHERE filters rows before grouping and HAVING filters groups after aggregation.

Task 5:

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). **Prompt:**

Code:

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Task-5:

#What is probability in points.
1.Probability is a branch of mathematics that deals with the likelihood of events occurring.
2.It is expressed as a number between 0 and 1, where 0 indicates an impossible event and 1 indicates a certain event.
3.Probability can be calculated using the formula: Probability = (Number of favorable outcomes) / (Total number of outcomes).
4.Probability is used in various fields, including statistics, finance, and science, to make predictions and informed decisions.

#Explain average in points.
1.Average, also known as the mean, is a measure of central tendency that represents the sum of a set of values divided by the number of values.
2.It provides a single value that summarises the overall level of a dataset.
3.The formula for calculating the average is: Average = (Sum of all values) / (Number of values).
4.Average is commonly used in statistics, finance, and everyday life to analyze data and make comparisons.

#Difference between speed and velocity in points.
1.Speed is a scalar quantity that refers to how fast an object is moving, while velocity is a vector quantity that includes both speed and direction of motion.
2.Speed is calculated as the distance traveled divided by the time taken, whereas velocity is calculated as the displacement divided by the time taken.
3.Speed is always a non negative value, while velocity can be positive, negative, or zero depending on the direction of motion.
4.Speed does not provide information about the direction of movement, while velocity specifies the direction along with the magnitude.

#How to solve time and work problems in points.
1.Time and work problems involve calculating the amount of work done by individuals or groups over a certain period.
2.To solve these problems, first determine the work rate of each individual or group, usually expressed as work done per unit of time (e.g., work/hour).
3.Use the formula: Work = Rate x Time to find the total work done or the time taken to complete a task.
4.For combined work problems, add the individual work rates together to find the total work rate, and then use it to calculate the total time required to complete the work.

#What is permutation in points?
1.Permutation is a mathematical concept that refers to the arrangement of objects in a specific order.
2.It is used to determine the number of possible arrangements of a set of items where the order matters.
3.The formula for calculating permutations of n items taken r at a time is: P(n, r) = n! / (n - r)!, where "!" denotes factorial.
4.Permutations are commonly used in combinatorics, probability, and statistics to solve problems related to arrangements and orderings.

**Rewrote the prompts for prompt refinement:**

#What is probability in points for school exams.
1.Probability is the study of how likely an event is to happen.
2.It is represented as a number between 0 and 1, where 0 means the event cannot happen and 1 means it will definitely happen.
3.Probability can be calculated using the formula: Probability = (Number of favorable outcomes) / (Total number of outcomes).
4.Probability is used in everyday life to make predictions and decisions based on uncertain events.

#Explain average in points for competitive exams.
1.Average, or mean, is a way to find the central value of a set of numbers.
2.It is calculated by adding all the numbers together and then dividing by how many numbers there are.
3.The formula for average is: Average = (Sum of all values) / (Number of values).
4.Average is useful in statistics and data analysis to summarize information and compare different datasets.

#Difference between speed and velocity in points in real life analogy.
1.Speed tells you how fast something is moving, like how quickly a car is driving on a road.
2.Velocity tells you both how fast something is moving and in which direction, like a car going north at 50 miles per hour.
3.Speed is just a number (like 60 mph), while velocity includes direction (like 60 mph north).
4.Speed cannot be negative, but velocity can be negative if the object is moving in the opposite direction.

#How to solve time and work problems in points in formula focus.
1.Time and work problems involve calculating how long it takes to complete a task based on the work done by individuals or groups.
2.To solve these problems, first find the work rate of each person or group, which is usually expressed as work done per unit of time (e.g., work/hour).
3.Use the formula: Work = Rate x Time to calculate the total work done or the time taken to finish a task.
4.For combined work problems, add the individual work rates together to find the total work rate, and then use it to calculate the total time required to complete the work.

#What is permutation in points in step by step focus.
1.Permutation is the arrangement of objects in a specific order where the order matters.
2.To calculate permutations, use the formula: P(n, r) = n! / (n - r)!, where n is the total number of items, r is the number of items to arrange, and "!" denotes factorial.
3.Factorial (n!) is the product of all positive integers up to n (e.g., 5! = 5 x 4 x 3 x 2 x 1 = 120).
4.Permutations are used in various fields, including combinatorics, probability, and statistics, to solve problems related to arrangements and orderings.
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Output:

Parameter	Original AI Responses	Rewritten Prompts
Completeness	5	5
Accuracy	5	5
Relevance	5	5
Clarity	4	5

Summary:

- **Completeness:** Both sets fully address each topic with all key points included.
- **Accuracy:** Both are factually correct and use appropriate mathematical/statistical terminology.
- **Relevance:** Both are relevant, but the rewritten prompts are more tailored to specific contexts (school, competitive exams, real-life, formula focus, step-by-step).
- **Clarity:** The rewritten prompts are clearer, with simpler language, analogies, and step-by-step explanations, making them easier to understand for their intended audience.

Conclusion:

Both sets are strong, but the rewritten prompts are superior in clarity and contextual relevance, making them more effective for targeted learning and communication.

Explanation:

These prompts are designed to test and reinforce understanding of fundamental concepts in mathematics and physics. Each prompt targets a specific topic, such as probability, averages, speed versus velocity, time and work problems, and permutations. They encourage clear, structured, and focused responses, often used in exams or interviews. The prompts help learners practice explaining concepts concisely and accurately. Overall, they serve as effective tools for both teaching and self-assessment.