

1.1

<p>Number: 1 Type: Zero-Shot Goal: Code Summarization (Java) Model: Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top P: 9</p> <pre>Summarize the functionality of the following method: (*public Map<String, Integer > countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; } The provided method 'countWordFrequency' takes a list of strings as input and returns a map that contains the frequency of each word in the list. Here's a step-by-step summary of its functionality: 1. **Method Signature:** - The method is public, meaning it can be accessed from outside the class. - It takes a single parameter, 'words', which is a List of String objects. - It returns a Map<String, Integer> where the key is a String representing a word, and the value is an Integer representing the frequency of that word. 2. **Initialization:** - A HashMap named 'freqMap' is created to store the word frequencies. 3. **Iteration:** - The method iterates over each word in the input list 'words'. - For each word, it calls the 'put' method of the 'HashMap' to update the frequency count. - The 'put' method takes two arguments: - The word itself. - The current frequency of the word, incremented by 1. If the word is not already in the map, 'getOrDefault' returns 0 (the default value). 4. **Return Statement:** - After iterating through all the words, the method returns the 'freqMap' containing the frequency of each word. ## Example If the input list is ["apple", "banana", "apple", "orange", "banana", "apple"], the output map will be: {"apple": 3, "banana": 2, "orange": 1}</pre> <p>Chat Data</p>	<p>Number: 1 Type: Zero-Shot Goal: Code Summarization (Java) Model: OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top P: 9</p> <pre>Summarize the functionality of the following method: (*public Map<String, Integer > countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; } The method 'countWordFrequency' takes a list of strings ('words') as input and returns a map that contains the frequency of each word in the list. Here's a breakdown of its functionality: 1. **Initialization:** It initializes an empty HashMap called 'freqMap', which will store words as keys and their corresponding counts as values. 2. **Counting Frequency:** It iterates through each word in the input list. For each word: - It uses 'getOrDefault' to retrieve the current count of the word from 'freqMap'. If the word is not already present in the map, it defaults to 0. - It increments the count by 1 and puts it back into 'freqMap'. 3. **Return Statement:** After processing all words, the method returns the 'freqMap', which contains the frequency of each word in the input list. In summary, the method efficiently counts and returns the frequency of each unique word in the provided list.</pre> <p>Chat Data</p>
--	---

In this case we can see that both models complete the task accurately, however Codestral gives a much more detailed explanation that GPT-4o mini in this case.

1.2

<p>Type: Prompt-Chaining Goal: Code Summarization (Java) Model: Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top P: 9</p> <pre>Timestamp: "2023-04-28T09:24:23.820Z", "role": "user", "message": "I want you to be a helpful coding assistant " : "Timestamp": "2023-04-28T09:24:24.752Z", "role": "assistant", "message": "Of course! I'd be happy to help you with your coding needs. Whether you need assistance with a specific programming language, debugging code, understanding a concept, or anything else related to coding, feel free to ask. What do you need help with?" : "Timestamp": "2023-04-28T09:24:30.320Z", "role": "user", "message": "Can you read this code? (*public Map<String, Integer > countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; }") : "Timestamp": "2023-04-28T09:24:39.518Z", "role": "assistant", "message": "Certainly! Let's break down the code step by step to understand what it does. ## Code Explanation: Java public Map<String, Integer> countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; } ## Components: 1. **Method Signature:** - Java - public Map<String, Integer> countWordFrequency(List<String> words) - This method is accessible from outside the class. - Map<String, Integer> freqMap: Declares a variable 'freqMap' of type Map with 'String' keys and 'Integer' values. - new HashMap<String>(): Initializes 'freqMap' as a new HashMap object. 3. **For Loop:** - Java for (String word : words) { freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } - For (String word : words) { iterates over each String in the 'words' list. - freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); This line increments the count of the word from 'freqMap'. If the 'word' is not present in the map, it returns '0'. - + 1: Increments the count by 1. - freqMap.put(..., ...): Puts the updated count back into the map with the 'word' as the key. 4. **Return Statement:** - Java return freqMap; - Returns the 'freqMap' which now contains the frequency of each word in the input list. ## What Does This Method Do? This method takes a list of words and returns a map where the keys are the words from the list and the values are the frequencies of those words in the list. For example, if the input list is ["apple", "banana", "apple", "orange", "banana", "apple"], the output map would be: {"apple": 3, "banana": 2, "orange": 1}</pre> <p>Chat Data</p>	<p>Type: Prompt-Chaining Goal: Code Summarization (Java) Model: OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top P: 9</p> <pre>Timestamp: "2023-04-28T09:10:31.298Z", "role": "user", "message": "I want you to be a helpful coding assistant " : "Timestamp": "2023-04-28T09:10:31.610Z", "role": "assistant", "message": "Of course! I'm here to help with any coding questions or challenges you have. What do you need assistance with?" : "Timestamp": "2023-04-28T09:10:41.412Z", "role": "user", "message": "Can you read this code? (*public Map<String, Integer > countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; }") : "Timestamp": "2023-04-28T09:10:50.638Z", "role": "assistant", "message": "Sure! Let's break down the code you provided. This is a method written in Java that counts the frequency of words in a given list. Java public Map<String, Integer> countWordFrequency(List<String> words){ Map<String, Integer> freqMap = new HashMap<String>(); for(String word : words){ freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); } return freqMap; } ## Explanation: 1. **Method Signature:** - Java - public Map<String, Integer> countWordFrequency(List<String> words) : This declares a public method called 'countWordFrequency' that takes a 'List' of 'String' objects (words) and return key as 'String' (the words) and the values are 'Integer' (the counts of each word). 2. **Map Declaration:** - Java Map<String, Integer> freqMap = new HashMap<String>(); : This creates a new HashMap instance called 'freqMap' to store the frequency of each word. 3. **For Loop:** - Java for (String word : words) : This loop iterates over each word in the provided list of words. 4. **Counting Frequency:** - Java freqMap.put(word, freqMap.getOrDefault(word, 0) + 1); : This line does the following: - freqMap.getOrDefault(word, 0) : This retrieves the current frequency count of the word from 'freqMap'. If the word is not already in the map, it returns '0'. - + 1 : This increments the count of the word by 1. - freqMap.put(..., ...): Updates the frequency of the word in the 'freqMap'. 5. **Return Statement:** - Java return freqMap; : After counting the words, the method returns the map containing the words and their corresponding counts. ## Summary: This method efficiently counts how many times each word appears in a list and returns the results in a Map. If you feed it a list of words, for example, ["apple", "banana", "apple"], it returns: {"apple": 2, "banana": 1}. This method efficiently counts how many times each word appears in a list and returns the results in a Map. If you feed it a list of words, for example, ["apple", "banana", "apple"], it returns: {"apple": 2, "banana": 1}.</pre> <p>Chat Data</p>
---	--

In this case we can see that both models complete the task accurately, however Codestral gives a much more detailed explanation than GPT-4o mini in this case.

2.1

Type	Zero-Shot	Type	Zero-Shot
Goal	Bug Fixing (Python – Off-by-One)	Goal	Bug Fixing (Python – Off-by-One)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7	Token Limit: 1024 Top-P: .9	Temperature: .7	Token Limit: 1024 Top-P: .9
	<pre>Identify and fix the off-by-one error in this function: ``` def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` The function 'sum_range' has an off-by-one error because the 'range' function in Python generates numbers starting from 'start' up to, but not including, 'end'. This means that if you want to include the 'end' value in the sum, you need to adjust the range. Here is the corrected version of the function: ```python def sum_range(start, end): total = 0 for i in range(start, end + 1): # Include end in the range total += i return total ``` By changing 'range(start, end)' to 'range(start, end + 1)', you ensure that the loop iterates over all integers from 'start' to 'end' inclusive.</pre>		<pre>Identify and fix the off-by-one error in this function: ``` def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` The function 'sum_range' has an off-by-one error in its range definition. The current implementation uses 'range(start, end)', which means it will exclude 'start' but include 'end'. If the intention is to include 'end' in the sum, you should adjust the range to 'range(start, end + 1)'. Here's the corrected version of the function: ```python def sum_range(start, end): total = 0 for i in range(start, end + 1): # Include 'end' in the range total += i return total ``` This will now correctly sum all integers from 'start' to 'end', inclusive.</pre>

In this case both models return the exact same updated version of the code.

2.2

Number	2	Number	2
Type	Few-shot	Type	Few-shot
Goal	Bug Fixing (Python – Off-by-One)	Goal	Bug Fixing (Python – Off-by-One)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7	Token Limit: 1024 Top-P: .9	Temperature: .7	Token Limit: 1024 Top-P: .9
	<p>Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Example 1:</p> <pre>-- Original Function --- def count_up(n): # supposed to sum numbers from 1 to n inclusive total = 0 for i in range(1, n): total += i return total -- Fix and Explanation --- def count_up_to(n): # sum numbers from 1 to n inclusive total = 0 for i in range(1, n + 1): # changed end to n + 1 total += i return total</pre> <p>Example 2:</p> <pre>-- Original Function --- def get_chars(): # supposed to return list of all characters in the string result = [] for i in range(len(s)): result.append(s[i]) return result</pre> <p>Now, identify and fix the off-by-one error in this function:</p> <pre>-- Original Function --- def sum_range(start, end): total = 0 for i in range(start, end): total += i return total -- Fix and Explanation --</pre> <p>{</p> <p>"timestamp": "2025-04-28T09:26:15.598Z", "role": "user", "message": "Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Example 1:</p> <pre>-- Original Function --- def count_up_to(n): # supposed to sum numbers from 1 to n inclusive total = 0 for i in range(1, n): total += i return total -- Fix and Explanation --- def count_up_to(n): # sum numbers from 1 to n inclusive total = 0 for i in range(1, n + 1): # changed end to n + 1 total += i return total</pre> <p>Example 2:</p> <pre>-- Original Function --- def get_chars(): # supposed to return list of all characters in the string result = [] for i in range(len(s) - 1): result.append(s[i]) return result -- Fix and Explanation --</pre> <p>{</p> <p>"timestamp": "2025-04-28T09:26:13.955Z", "role": "user", "message": "Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Example 1:</p> <pre>-- Original Function --- def count_up_to(n): # supposed to sum numbers from 1 to n inclusive total = 0 for i in range(1, n): total += i return total -- Fix and Explanation --- def count_up_to(n): # sum numbers from 1 to n inclusive total = 0 for i in range(1, n + 1): # changed end to n + 1 total += i return total</pre> <p>Example 2:</p> <pre>-- Original Function --- def get_chars(): # supposed to return list of all characters in the string result = [] for i in range(len(s) - 1): result.append(s[i]) return result -- Fix and Explanation --</pre> <p>{</p> <p>"timestamp": "2025-04-28T09:26:13.955Z", "role": "user", "message": "Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Now, identify and fix the off-by-one error in this function:</p> <pre>-- Original Function --- def sum_range(start, end): total = 0 for i in range(start, end): total += i return total -- Fix and Explanation --</pre> <p>{</p> <p>"timestamp": "2025-04-28T09:26:13.955Z", "role": "user", "message": "Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Now, identify and fix the off-by-one error in this function:</p> <pre>-- Original Function --- def sum_range(start, end): total = 0 for i in range(start, end): total += i return total</pre>	<p>Below are examples of Python functions with an off-by-one error and their corrected versions.</p> <p>Example 1:</p> <pre>-- Original Function --- def count_up_to(n): # supposed to sum numbers from 1 to n inclusive total = 0 for i in range(1, n): total += i return total -- Fix and Explanation -- def count_up_to(n): # sum numbers from 1 to n inclusive total = 0 for i in range(1, n + 1): # changed end to n + 1 total += i return total</pre> <p>Example 2:</p> <pre>-- Original Function -- def get_chars(): # return list of all characters in the string result = [] for i in range(len(s)): result.append(s[i]) return result</pre> <p>Now, identify and fix the off-by-one error in this function:</p> <pre>-- Original Function -- def sum_range(start, end): total = 0 for i in range(start, end): total += i return total</pre>	

<pre> def sum_range(start, end): total = 0 for i in range(start, end): total += i return total -- Fix and Explanation --- ``` { "timestamp": "2025-04-28T09:26:18.349Z", "role": "assistant", "message": "The off-by-one error in the original 'sum_range' function is that it does not include the 'end' value in the summation. The 'range' function in Python generates numbers starting from 'start' up to, but not including, 'end'. To include the 'end' value, you need to adjust the range to go up to 'end + 1'."} Here is the corrected function with an explanation: ```python def sum_range(start, end): total = 0 for i in range(start, end + 1): # changed end to end + 1 total += i return total ``` ### Explanation: - The original function 'range(start, end)' generates numbers from 'start' to 'end - 1'. - By changing 'range(start, end)' to 'range(start, end + 1)', we ensure that the loop includes the 'end' value in the summation. This fix ensures that the function correctly sums all integers from 'start' to 'end' inclusive. } </pre>	<pre> for i in range(start, end): total += i return total -- Fix and Explanation --- ``` { "timestamp": "2025-04-28T09:26:15.933Z", "role": "assistant", "message": "Original Function ---" } def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` -- Fix and Explanation --- ``` python def sum_range(start, end): total = 0 for i in range(start, end + 1): # changed end to end + 1 to include 'end' in the sum total += i return total ``` ### Explanation: - The original function 'sum_range' is designed to sum numbers from 'start' to 'end' inclusive. However, the 'for' loop only iterates up to 'end - 1' because of the way the 'range' function works in Python. To include 'end' in the summation, we change the loop to iterate to 'end + 1'. } </pre>
--	---

Even for a different prompt strategy, both models return the exact same updated version of the code.

3.1

<p>Number: 3 Type: Zero-Shot Goal: Bug Classification (C++) Model: Codestar 25.01 Transcript Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Identify and fix the off-by-one error in this function: ``` def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` Certainly! Let's address the off-by-one error in the 'sum_range' function first, and then we'll look at the issue in the 'getArray' function. ### Python Function - Fixing the Off-by-One Error The 'sum_range' function is intended to sum all integers from 'start' to 'end' (exclusive). The off-by-one error occurs because the 'range' function in Python generates numbers from 'start' to 'end-1'. However, since 'end' is exclusive, you actually want to sum from 'start' to 'end-1'. The function is already correct in this respect because 'range(start, end)' generates numbers from 'start' to 'end-1'. Here is the corrected and properly formatted 'sum_range' function: ```python def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` </pre>	<p>Number: 3 Type: Zero-Shot Goal: Bug Classification (C++) Model: OpenAI GPT-4o mini Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Identify and fix the off-by-one error in this function: ``` def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` Let's address both pieces of code you provided, focusing on fixing the off-by-one error in the first function and the issue in the second C function. ### Python Function - Fixing the Off-by-One Error The original Python function 'sum_range' is defined as: ```python def sum_range(start, end): total = 0 for i in range(start, end): total += i return total ``` </pre>
<p>To fix this, you should allocate memory dynamically using 'malloc' and ensure that the caller of the function is responsible for freeing the allocated memory. Here is the corrected 'getArray' function:</p> <pre> ``` c #include <stdlib.h> int* getArray(int size) { int* arr = (int*)malloc(size * sizeof(int)); // Dynamically allocate memory return arr; } ### Usage Example Here is how you might use the corrected 'getArray' function in a program and ensure proper memory management: ``` c #include <stdlib.h> #include <stdio.h> int* getArray(int size) { int* arr = (int*)malloc(size * sizeof(int)); // Dynamically allocate memory return arr; } main() { int size = 5; int* arr = getArray(size); // Use the array as needed for (int i = 0; i < size; i++) { arr[i] = i * 2; printf("%d ", arr[i]); } printf("\n"); // Free the allocated memory free(arr); return 0; } ``` By dynamically allocating memory, you ensure that the array persists beyond the function's scope, and you avoid undefined behavior. </pre>	<p>Now, 'sum_range(1, 5)' will correctly return '15' as it includes '5' in the sum.</p> <p>C Function - Fixing the Returning of a Local Array</p> <p>The C function you provided is:</p> <pre> ``` c int* getArray(int size) { int arr[size]; // Warning: local array return arr; // Bug: returning pointer to local variable } ``` In this function, 'arr' is a local variable (a stack-allocated array), and returning a pointer to it will lead to undefined behavior because the memory will be invalid once the function exits.</pre> <p>To fix this, you can dynamically allocate memory for the array using 'malloc' and then return the pointer to that memory:</p> <pre> ``` c #include <stdlib.h> // Include for malloc and free int* getArray(int size) { int* arr = malloc(size * sizeof(int)); // Dynamically allocate memory if (arr == NULL) { // Handle memory allocation failure if needed return NULL; } return arr; // Now returning pointer to dynamically allocated memory } ``` Don't forget to 'free(arr)' in the calling function once you're done using the array to avoid memory leaks.</pre> <p>Summary of Fixes</p> <ol style="list-style-type: none"> 1. Python function: Changed 'range(start, end)' to 'range(start, end + 1)' to include 'end'. 2. C function: Changed local array to dynamically allocated memory using 'malloc'.

In this case both corrections similarly switch to using Dynamic allocation, except for the way they do it is just slightly different.

3.2

Both models here find the same correction to the code.

4.1

Number	4	Number	4
Type	Zero-Shot	Type	Zero-Shot
Goal	Generating Email Validators (Python + Regex)	Goal	Generating Email Validators (Python + Regex)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7 Token Limit	1024 Top-P: .9	Temperature: .7 Token Limit:	1024 Top-P: .9
Complete the function using regex to validate basic email addresses: ```python def is_valid_email(email): # TODO: Complete using regex pass ```		Complete the function using regex to validate basic email addresses: ```python def is_valid_email(email): # TODO: Complete using regex pass ```	
To validate basic email addresses using regular expressions, you can use a regex pattern that matches the general structure of an email address. A basic email address typically consists of: 1. Local part (before the '@' symbol), which can include letters, digits, dots, underscores, and hyphens. 2. A single '@' symbol. 3. Domain part (after the '@' symbol), which can include letters, digits, dots, and hyphens, but must end with a domain suffix (e.g., '.com', '.net', etc.).		To validate basic email addresses using regular expressions (regex) in Python, we can define the 'is_valid_email' function. A common pattern to check for valid email addresses involves ensuring that the email has a username, an '@' symbol, a domain name, and a top-level domain (TLD). Here's a simple regex pattern that captures the general structure of an email address: 1. The username can contain letters, digits, underscores, hyphens, and periods. 2. The '@' symbol separates the username from the domain. 3. The domain can have letters, digits, hyphens, and periods. 4. The TLD must contain at least one letter.	
Here is a basic regex pattern that can be used to validate such email addresses: ```python '^[a-zA-Z0-9_.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}\$'		Here's how you can implement the 'is_valid_email' function: ```python import re def is_valid_email(email): # Define the regex pattern for a valid email address pattern = '^([a-zA-Z0-9_.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,})\$' # Use re.match to check if the email matches the pattern return re.match(pattern, email) is not None	
The pattern breakdown: - `^` : Starts the regex pattern. - `([a-zA-Z0-9_.%+-]+)` : Ensures the local part starts with a letter, digit, dot, underscore, percent, plus, or hyphen, and can include multiple of these characters. - `@` : The '@' symbol. - `([a-zA-Z0-9.-]+)` : Ensures the domain part starts with a letter, digit, dot, or hyphen, and can include multiple of these characters. - `(\.[a-zA-Z]{2,})\$` : Ensures the domain ends with a dot followed by at least two letters (the top-level domain).		### Explanation of the Regex Pattern: - `^` : Starts the regex pattern. - `([a-zA-Z0-9_.%+-]+)` : Matches one or more characters that are letters, digits, dots, underscores, percent signs, plus signs, or hyphens (the username). - `@` : Matches the '@' symbol. - `([a-zA-Z0-9.-]+)` : Matches one or more characters that are letters, digits, dots, or hyphens (the domain). - `(\.[a-zA-Z]{2,})` : Ensures the domain ends with a dot followed by at least two letters (the top-level domain).	
Here is the completed function: ```python import re			

<pre>def is_valid_email(email): pattern = r'^[a-zA-Z0-9-.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}\$' return re.match(pattern, email) is not None # Test cases print(is_valid_email("test@example.com")) # True print(is_valid_email("user@tag-sorting@example.com")) # True print(is_valid_email("user.name@domain.co.uk")) # True print(is_valid_email("invalid-email@com")) # False print(is_valid_email("plainaddress")) # False print(is_valid_email("@missingusername.com")) # False ...</pre> <p>This function will return 'True' if the email address matches the pattern and 'False' otherwise. The test cases provided should help you verify that the function works as expected.</p>	<p>Chat Data</p>	<p>- `.`: Matches a literal dot. - `[a-zA-Z]{2,}`: Matches the top-level domain, which must consist of at least two letters. - `\$` Asserts the end of the string.</p> <p>This function will return 'True' if the email is valid according to the defined pattern, and 'False' otherwise.</p> <p>## Example Usage:</p> <pre>python print(is_valid_email("example@example.com")) # True print(is_valid_email("user.name@domain.co.uk")) # True print(is_valid_email("invalid-email@com")) # False print(is_valid_email("another_invalid@domain")) # False</pre> <p>Feel free to modify the regex pattern as needed for more specific email validation rules.</p>
--	------------------	--

Both models ended up using the same Regex which is quite interesting, and probably means that it is somewhere on the internet which is where they got in from for their training set.

4.2

<p>Number 4</p> <p>Type Self-Consistency</p> <p>Goal Generating Email Validators (Python + Regex)</p> <p>Model Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <p>Chat Data</p> <pre>Complete the function using regex to validate basic email addresses: ``` def is_valid_email(email): # TODO: Complete using regex pass ``` To validate basic email addresses using a regular expression (regex), you can use the following pattern: ``` ^([a-zA-Z0-9-.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,})\$``` Here's a breakdown of the regex pattern: - `^([a-zA-Z0-9-.%+-]+)` : Ensures the email starts with one or more alphanumeric characters, dots, underscores, percent signs, plus signs, or hyphens. - `@[a-zA-Z0-9.-]+` : Ensures the email contains an '@' symbol followed by one or more alphanumeric characters, dots, or hyphens (the domain part). - `\.[a-zA-Z]{2,}\$` : Ensures the email ends with a dot followed by two or more alphabetic characters (the top-level domain). Here is the complete function: ``` python import re def is_valid_email(email): pattern = r'^([a-zA-Z0-9-.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,})\$' return re.match(pattern, email) is not None ``` # Example usage: ``` print(is_valid_email("test@example.com")) # True print(is_valid_email("invalid-email@com")) # False print(is_valid_email("another@test@domain.co.uk")) # False ``` This function uses the 're.match' method to check if the email matches the specified pattern. If it matches, the function returns 'True'; otherwise, it returns 'False'. </pre>	<p>Chat Data</p>	<p>Number 4</p> <p>Type Self-Consistency</p> <p>Goal Generating Email Validators (Python + Regex)</p> <p>Model OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <p>Chat Data</p> <pre>Complete the function using regex to validate basic email addresses: ``` def is_valid_email(email): # TODO: Complete using regex pass ``` To validate basic email addresses using regular expressions (regex), we can define a function 'is_valid_email' that checks if the given email matches a specific pattern. Here's a typical regex pattern for validating email addresses, along with the implementation of the function: ``` python import re def is_valid_email(email): # Define a regex pattern for basic email validation pattern = r'^([a-zA-Z0-9-.%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,})\$' # Use re.match to check if the email matches the pattern return re.match(pattern, email) is not None ``` ## Explanation of the Regex Pattern: - `^` asserts the start of the string. - `([a-zA-Z0-9-.%+-]+)` matches one or more characters that can be letters (upper and lower case), digits, and certain special characters (., %, -, +, -). - `@` matches the '@' symbol. - `([a-zA-Z0-9.-]+)` matches one or more characters that can be letters (upper and lower case), digits, and certain special characters (., -). - `.` matches the dot character, which separates the domain and the top-level domain (TLD). - `\.[a-zA-Z]{2,}` matches the top-level domain, which consists of at least two letters. - `\$` asserts the end of the string. ## Usage Example: You can use this function to check if an email is valid: ``` python print(is_valid_email("example@example.com")) # True print(is_valid_email("invalid-email@com")) # True print(is_valid_email("invalid-email@com")) # False ``` This function provides a basic validation for email addresses, which is adequate for many scenarios. However, keep in mind that more complex email validation might be necessary for specific applications. </pre>
--	------------------	--

In this self-consistency comparison both models also end up returning the same regex, which does make sense however since it isn't really a creative task.

5.1

<p>Number 5</p> <p>Type Zero-Shot</p> <p>Goal Generating Flask APIs (Python)</p> <p>Model Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <p>Chat Data</p> <pre>Create a '/greet/<username>' endpoint that returns a JSON greeting: ``` from flask import Flask, jsonify app = Flask(__name__) @app.route('/greet/<username>') def greet(username): # TODO: Return a JSON greeting pass ``` Sure, I can help you complete the '/greet/<username>' endpoint to return a JSON greeting. Here's the completed code: ``` python from flask import Flask, jsonify app = Flask(__name__) @app.route('/greet/<username>') def greet(username): greeting = "Hello, " + username + "!" return jsonify(greeting=greeting) if __name__ == '__main__': app.run(debug=True) ``` Here's what's happening in the code: 1. We import the necessary modules: 'Flask' for creating the app and 'jsonify' for returning JSON responses. 2. We create an instance of the Flask class. 3. We define the '/greet/<username>' route. 4. Inside the 'greet' function, we create a greeting message that includes the 'username'. 5. We use 'jsonify' to return the greeting as a JSON response. 6. Finally, we run the app with 'debug=True' for development purposes. </pre>	<p>Chat Data</p>	<p>Number 5</p> <p>Type Zero-Shot</p> <p>Goal Generating Flask APIs (Python)</p> <p>Model OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <p>Chat Data</p> <pre>Create a '/greet/<username>' endpoint that returns a JSON greeting: ``` from flask import Flask, jsonify app = Flask(__name__) @app.route('/greet/<username>') def greet(username): # TODO: Return a JSON greeting pass ``` To implement the '/greet/<username>' endpoint that returns a JSON greeting, you can modify the 'greet' function to create a greeting message and return it as a JSON response using 'jsonify'. Here's how you can do it: ``` python from flask import Flask, jsonify app = Flask(__name__) @app.route('/greet/<username>') def greet(username): # Create a greeting message greeting = "Hello, " + username + "!" # Return the greeting as a JSON response return jsonify(greeting=greeting) if __name__ == '__main__': app.run(debug=True) ``` ## Explanation: 1. The 'greet' function takes a 'username' parameter from the URL. 2. It constructs a greeting message using that username. 3. The 'jsonify' function is used to create a JSON response containing the greeting message. 4. Finally, the application runs in debug mode, which is useful for development. ## Running the Application: To run this Flask application, save the code in a Python file (e.g., 'app.py') and execute it. You can then access the endpoint by navigating to <a href="http://127.0.0.1:5000/greet/<username>">http://127.0.0.1:5000/greet/<username> in your web browser or using a tool like 'curl' or Postman, replacing '<username>' with any name you want. </pre>
--	------------------	--

Both codes return code that does the same thing, although 4-o mini generates more comments explaining the code in the actual code itself and uses different variable names.

5.2

In this case they return slightly different code as well, but it does the same thing and codestral's output is also much longer.

6.1

Number	6	Number	6
Type	Zero-Shot	Type	Zero-Shot
Goal	SQL Schema Design (SQL)	Goal	SQL Schema Design (SQL)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4 mini
Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9
<pre>Write the schema for a review app with users, books, and reviews: ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` To design a schema for a review app with users, books, and reviews, we need to ensure that the relationships between these entities are properly enforced. Here is a schema design with appropriate keys and constraints: ```sql -- Table for users CREATE TABLE users (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL); -- Table for books CREATE TABLE books (id SERIAL PRIMARY KEY, title VARCHAR(255) NOT NULL); -- Table for reviews CREATE TABLE reviews (id SERIAL PRIMARY KEY, user_id INT NOT NULL, book_id INT NOT NULL, rating INT CHECK (rating >= 1 AND rating <= 5), review TEXT, created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP, FOREIGN KEY (user_id) REFERENCES users(id) ON DELETE CASCADE, FOREIGN KEY (book_id) REFERENCES books(id) ON DELETE CASCADE); ``` </pre>	<pre>Write the schema for a review app with users, books, and reviews: ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` To design a schema for a review app with users, books, and reviews, we need to consider the relationships between the entities and ensure that we have appropriate primary keys, foreign keys, and constraints. Below is a proposed schema in SQL format: ```sql -- Create the users table CREATE TABLE users (id SERIAL PRIMARY KEY, -- Unique identifier for each user name VARCHAR(100) NOT NULL -- Name of the user); -- Create the books table CREATE TABLE books (id SERIAL PRIMARY KEY, -- Unique identifier for each book title VARCHAR(255) NOT NULL -- Title of the book); -- Create the reviews table CREATE TABLE reviews (id SERIAL PRIMARY KEY, -- Unique identifier for each review user_id INT NOT NULL, -- User who wrote the review book_id INT NOT NULL, -- Book being reviewed rating INT CHECK (rating >= 1 AND rating <= 5), -- Rating between 1 and 5 created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP, -- Timestamp of when the review was created FOREIGN KEY (user_id) REFERENCES users(id) ON DELETE CASCADE, -- Foreign key constraint to users FOREIGN KEY (book_id) REFERENCES books(id) ON DELETE CASCADE -- Foreign key constraint to books); ``` </pre>	<pre>## Explanation of the Schema 1. **Users Table**: - `id`: A unique identifier for each user, using the 'SERIAL' type for auto-incrementing integer values. - `name`: A 'VARCHAR' field to store the name of the user, which cannot be null. 2. **Books Table**: - `id`: A unique identifier for each book, also using 'SERIAL'. - `title`: A 'VARCHAR' field to store the title of the book, which cannot be null. 3. **Reviews Table**: - `id`: A unique identifier for each review, using 'SERIAL'. - `user_id`: An integer that references the 'id' in the 'users' table. This column cannot be null and has a foreign key constraint similar to 'user_id'. - `book_id`: An integer that references the 'id' in the 'books' table. This column cannot be null and also has a foreign key constraint similar to 'user_id'. - `rating`: An integer that represents the rating given in the review. It includes a check constraint to ensure the rating is between 1 and 5. - `created_at`: A timestamp that defaults to the current time when the review is created. ## Notes - The design includes referential integrity to ensure that reviews are tied to existing users and books. - The 'ON DELETE CASCADE' option ensures that when a user or book is deleted, any associated reviews are also removed. - Additional fields can be added to the tables as needed, such as email for users or author for books, depending on the specific requirements of the application.</pre>	

Both models create fairly similar schema in this case and explain it, but the Codestral one gives a bigger variable size for the name for some reason.

6.2

Number	6	Number	6
Type	Chain-of-thought	Type	Chain-of-thought
Goal	SQL Schema Design (SQL)	Goal	SQL Schema Design (SQL)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4 mini
Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9
<pre>Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews: ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:28:49.795Z", "role": "user", "message": "Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews." } ``` ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:28:50.898Z", "role": "assistant", "message": "Sure, let's work through the problem step by step to design a schema for a review app with users, books, and reviews. ## Step 1: Identify Entities and Relationships We have three main entities:</pre>	<pre>Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews: ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:28:49.795Z", "role": "user", "message": "Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews." } ``` ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:29:09.701Z", "role": "assistant", "message": "To design a schema for a review app that involves users, books, and reviews, we need to carefully consider the relationships between these entities. Below is the proposed schema with the necessary tables, keys, and constraints. ## Schema Overview 1. **Users Table**: - Represents the users of the review system. - Fields: - `id` (Primary Key, Integer, Auto-increment) - `name` (VARCHAR, Not Null, Unique) – The name of the user. - `email` (VARCHAR, Not Null, Unique) – To identify users uniquely and facilitate login. 2. **Books Table**: - Represents the books that can be reviewed. </pre>	<pre>Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews: ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:28:49.795Z", "role": "user", "message": "Work through the following problem, thinking about it step by step. Write the schema for a review app with users, books, and reviews." } ``` ``` -- TODO: Design schema with appropriate keys and constraints -- Tables: users(id, name), books(id, title), reviews(id, user_id, book_id, rating) ``` ``` { "timestamp": "2025-04-28T09:28:50.898Z", "role": "assistant", "message": "Sure, let's work through the problem step by step to design a schema for a review app with users, books, and reviews. ## Step 1: Identify Entities and Relationships We have three main entities:</pre>	

<pre> 1. **Users** 2. **Books** 3. **Reviews** The relationships between these entities are: - A user can write multiple reviews. - A book can have multiple reviews. - A review is written by one user and for one book. ### Step 2: Define Attributes for Each Entity Let's define the attributes for each entity: - **Users**: id, name - **Books**: id, title - **Reviews**: id, user_id, book_id, rating ### Step 3: Define Keys and Constraints We need to define primary keys, foreign keys, and any other necessary constraints to ensure data integrity. ### Step 4: Create the Schema Here is the schema with appropriate keys and constraints: ```sql -- Users table CREATE TABLE users (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL); -- Books table CREATE TABLE books (id SERIAL PRIMARY KEY, title VARCHAR(255) NOT NULL); -- Reviews table CREATE TABLE reviews (id SERIAL PRIMARY KEY, user_id INTEGER NOT NULL, book_id INTEGER NOT NULL, rating INTEGER CHECK (rating >= 1 AND rating <= 5), -- Assuming rating is between 1 and 5 FOREIGN KEY (user_id) REFERENCES users(id) ON DELETE CASCADE, FOREIGN KEY (book_id) REFERENCES books(id) ON DELETE CASCADE); ``` </pre>	<p>- Fields: - 'id' (Primary Key, Integer, Auto-increment) - 'name' (Varchar, Not Null) – The title of the book. - 'author' (Varchar, Not Null) – The author of the book. - 'published_date' (Date) – Optional; to keep track of when the book was published. - 'isbn' (Varchar, Unique) – Storing unique identifiers like ISBN for the book.</p> <p>3. **Reviews Table** - Represents reviews made by users on books. - Fields: - 'id' (Primary Key, Integer, Auto-increment) - 'user_id' (Foreign Key, Integer, Not Null) – References the 'id' in the 'users' table. - 'book_id' (Foreign Key, Integer, Not Null) – References the 'id' in the 'books' table. - 'rating' (Integer, Not Null) – Rating given by the user (e.g., 1-5 stars). - 'comment' (Text) – Optional; to allow users to write additional comments on their reviews. - 'created_at' (Timestamp, Not Null) – Automatically stores the date and time the review was created.</p> <p>### SQL Schema Definition</p> <p>Based on the above design, here's the SQL schema for the three tables:</p> <pre> ```sql -- Users Table CREATE TABLE users (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL UNIQUE, email VARCHAR(255) NOT NULL UNIQUE); -- Books Table CREATE TABLE books (id SERIAL PRIMARY KEY, title VARCHAR(255) NOT NULL, author VARCHAR(255) NOT NULL, published_date DATE, isbn VARCHAR(13) UNIQUE); -- Reviews Table CREATE TABLE reviews (id SERIAL PRIMARY KEY, user_id INT NOT NULL, book_id INT NOT NULL, rating INT NOT NULL CHECK (rating >= 1 AND rating <= 5), comment TEXT, created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP); ``` </pre>
<pre> #### Explanation: 1. **Users Table**: - 'id': Primary key, auto-incremented. - 'name': Name of the user, not null. 2. **Books Table**: - 'id': Primary key, auto-incremented. - 'title': Title of the book, not null. 3. **Reviews Table**: - 'id': Primary key, auto-incremented. - 'user_id': Foreign key referencing 'users(id)', not null. The 'ON DELETE CASCADE' ensures that if a user is deleted, all their reviews are also deleted. - 'book_id': Foreign key referencing 'books(id)', not null. The 'ON DELETE CASCADE' ensures that if a book is deleted, all its reviews are also deleted. - 'rating': Rating given by the user for the book, with a check constraint to ensure the rating is between 1 and 5. This schema ensures that the relationships between users, books, and reviews are properly enforced, and it maintains data integrity through the use of foreign keys and constraints. } } </pre> <p>Chat Data</p>	<pre> rating INT NOT NULL CHECK (rating >= 1 AND rating <= 5), comment TEXT, created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP, FOREIGN KEY (user_id) REFERENCES users(id) ON DELETE CASCADE, FOREIGN KEY (book_id) REFERENCES books(id) ON DELETE CASCADE }; #### Explanation of Keys and Constraints - **Primary Key**: Each table has an 'id' field which serves as the primary key, ensuring each record is unique. - **Foreign Keys**: - In the 'Reviews' table, 'user_id' references 'users(id)' and 'book_id' references 'books(id)'. These relationships allow us to associate reviews with specific users and books. - **Unique Constraints**: The 'email' and 'name' fields in the 'users' table and the 'isbn' in the 'books' table should be unique to avoid duplicates. - **Rating Check**: The 'rating' in the 'reviews' table is constrained to be between 1 and 5 to ensure valid ratings. - **Timestamp**: The 'created_at' field in the 'reviews' table keeps track of when the review was created, which is important for chronological ordering of reviews. This schema allows for a flexible and efficient review system while maintaining data integrity through primary and foreign keys. } } </pre> <p>Chat Data</p>

In this case GPT-o4 mini hallucinates an extra variable in the users table called email, which is interesting.

7.1

<table border="1"> <tr> <td>Number</td><td>7</td></tr> <tr> <td>Type</td><td>Zero-Shot</td></tr> <tr> <td>Goal</td><td>Null Dereference Detection (Java)</td></tr> <tr> <td>Model</td><td>Codestrail 25.01 Transcript</td></tr> <tr> <td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> Identify any null dereference risk: public int getLength(String s) { return s.length(); // What if s is null? } The code snippet you provided has a potential null dereference risk. Specifically, the 's.length()' method call will throw a 'NullPointerException' if the string 's' is 'null'. To mitigate this risk, you should add a null check before calling the 'length()' method. Here is an improved version of the code with the null check: ``` java public int getLength(String s) { if (s == null) { // Handle the null case appropriately, e.g., return 0 or throw an exception return 0; // or throw new IllegalArgumentException("String cannot be null"); } return s.length(); } ``` </pre> <p>In this improved version, if 's' is 'null', the method will return 0 (or throw an 'IllegalArgumentException', depending on your preference for handling the null case). This prevents the 'NullPointerException' from being thrown. </p> <p>Chat Data</p>	Number	7	Type	Zero-Shot	Goal	Null Dereference Detection (Java)	Model	Codestrail 25.01 Transcript	Temperature: .7 Token Limit: 1024 Top-P: .9		<table border="1"> <tr> <td>Number</td><td>7</td></tr> <tr> <td>Type</td><td>Zero-Shot</td></tr> <tr> <td>Goal</td><td>Null Dereference Detection (Java)</td></tr> <tr> <td>Model</td><td>OpenAI GPT-4 mini</td></tr> <tr> <td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> Identify any null dereference risk: ``` public int getLength(String s) { return s.length(); // What if s is null? } ``` </pre> <p>In the provided code snippet, there is indeed a risk of a null dereference. The method 'getLength(String s)' calls 's.length()', which will throw a 'NullPointerException' if the input string 's' is null.</p> <p>To mitigate this risk, you can add a null check before attempting to access the length of the string. Here's an example of how you could modify the method:</p> <pre> ``` java public int getLength(String s) { if (s == null) { return 0; // or handle the null case appropriately } return s.length(); } ``` </pre> <p>In this modified version, if the input 's' is null, the method returns 0 (or you can choose to handle it in another way, such as throwing an exception or returning a special value). This prevents the potential null dereference. </p> <p>Chat Data</p>	Number	7	Type	Zero-Shot	Goal	Null Dereference Detection (Java)	Model	OpenAI GPT-4 mini	Temperature: .7 Token Limit: 1024 Top-P: .9	
Number	7																				
Type	Zero-Shot																				
Goal	Null Dereference Detection (Java)																				
Model	Codestrail 25.01 Transcript																				
Temperature: .7 Token Limit: 1024 Top-P: .9																					
Number	7																				
Type	Zero-Shot																				
Goal	Null Dereference Detection (Java)																				
Model	OpenAI GPT-4 mini																				
Temperature: .7 Token Limit: 1024 Top-P: .9																					

Both models handle checking for null in the same manner in this case.

7.2

Number	7	Number	7
Type	Prompt-Chaining	Type	Prompt-Chaining
Goal	Null Dereference Detection (Java)	Goal	Null Dereference Detection (Java)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9	Temperature: .7 Token Limit: 1024 Top-P: .9
<pre>[{"timestamp": "2025-04-28T09:47:17.133Z", "role": "user", "message": "Here is some code, wait for more instructions"}] [{"timestamp": "2025-04-28T09:47:17.511Z", "role": "assistant", "message": "Sure, I'll wait for further instructions."}] [{"timestamp": "2025-04-28T09:47:39.077Z", "role": "user", "message": "Identify any null dereference risk in the code."}] [{"timestamp": "2025-04-28T09:47:44.832Z", "role": "assistant", "message": "The source of Please let's how set.code code: "public class Person { public Person(String name) { this.name = name; } public String getName() { return name; } public void setName(String name) { this.name = name; } }"}]</pre>			
<pre>""" The provided code does not explicitly check for null values when accessing or modifying the 'name' field. This can lead to a 'NullPointerException' if 'name' is null. Here are a few ways to mitigate this risk: 1. **Initialize 'name' in the constructor:** ```java public class Person { private String name; public Person(String name) { if (name == null) { throw new IllegalArgumentException("Name cannot be null"); } this.name = name; } public String getName() { return name; } public void setName(String name) { if (name == null) { throw new IllegalArgumentException("Name cannot be null"); } this.name = name; } } ``` 2. **Use optional:** ```java import java.util.Optional; public class Person { private Optional<String> name = Optional.empty(); public Person(String name) { this.name = Optional.ofNullable(name); } public Optional<String> getName() { return name; } } ``` </pre>		<pre>[{"timestamp": "2025-04-28T09:48:02.565Z", "role": "user", "message": "Here is some code, wait for more instructions"}] [{"timestamp": "2025-04-28T09:48:04.358Z", "role": "assistant", "message": "It looks like you've shared a snippet of Java code that defines a method to get the length of a given string. The method getLength takes a String 's' as an argument and returns its length using the 'length()' method of the String class."}] [{"timestamp": "2025-04-28T09:48:13.732Z", "role": "user", "message": "If you have further instructions or questions about this code, such as modifications, explanations, or related tasks, please let me know!"}] [{"timestamp": "2025-04-28T09:48:16.337Z", "role": "assistant", "message": "In the provided code snippet: "}] </pre>	
<pre>public void setName(String name) { this.name = Optional.ofNullable(name); } ``` 3. **Use 'Objects.requireNonNull':** ```java import java.util.Objects; public class Person { private String name; public Person(String name) { this.name = Objects.requireNonNull(name, "Name cannot be null"); } public String getName() { return name; } public void setName(String name) { this.name = Objects.requireNonNull(name, "Name cannot be null"); } } ``` These changes ensure that 'name' is never null, avoiding 'NullPointerException' and making the code more robust. </pre> <p>Chat Data</p>	<pre>[{"timestamp": "2025-04-28T09:48:16.337Z", "role": "assistant", "message": "In the provided code snippet: "}] [{"timestamp": "2025-04-28T09:48:16.337Z", "role": "user", "message": "There is a potential risk of a null dereference if the input 's' is 'null'. If you call 'getLength(null)', it will result in a 'NullPointerException', since you're attempting to invoke the 'length()' method on a 'null' reference."}] [{"timestamp": "2025-04-28T09:48:16.337Z", "role": "assistant", "message": "To mitigate this risk, you should check for 'null' before calling the 'length()' method. Here's an updated version of the method that includes a null check: "}] [{"timestamp": "2025-04-28T09:48:16.337Z", "role": "user", "message": "In this revised version, if 's' is 'null', the method returns '0', indicating that there is no length for a 'null' string. Alternatively, depending on your requirements, you could throw an 'IllegalArgumentException' or handle 'null' strings in another way."}] </pre> <p>Chat Data</p>		

In this case the codestral output is much longer, but they both still handle the null argument problem.

8.1

Number	8	Number	8
Type	Zero-Shot	Type	Zero-Shot
Goal	CSV Parser Variants (Python)	Goal	CSV Parser Variants (Python)
Model	Codestratal 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7 Token Limit: 1024 Top-P: .9		Temperature: .7 Token Limit: 1024 Top-P: .9	
	Improve the parser to support quoted fields: ... def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields ... To improve the 'parse_csv_line' function to support quoted fields, we need to handle cases where fields may contain commas within quotes. Here's an enhanced version of the function that correctly parses CSV lines, including those with quoted fields: ```python import csv from io import StringIO def parse_csv_line(line): # Use the csv module to handle quoted fields reader = csv.reader(StringIO(line)) return next(reader) # Example usage: line = "John Doe,\"123 Main St.,Anytown,CA" parsed_line = parse_csv_line(line) print(parsed_line) ... ### Explanation: 1. **Import csv Module**: We import Python's built-in 'csv' module, which provides functionality to read and write CSV files. 2. **StringIO**: We use 'StringIO' to treat the input line as a file-like object, allowing us to pass it to the 'csv.reader'. 3. **csv.reader**: We create a 'csv.reader' object that reads from the 'StringIO' object. 4. **next(reader)**: This retrieves the first (and only) line from the reader, which gives us a list of fields, even if some fields contain commas within quotes.		Improve the parser to support quoted fields: ... def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields ... To improve the 'parse_csv_line' function to handle quoted fields in CSV lines, we can use the 'csv' module from Python's standard library. This module is designed specifically for parsing CSV files and can correctly handle cases where fields are enclosed in quotes, including fields that contain commas within them. Here's how you can implement this: ```python import csv from io import StringIO def parse_csv_line(line): # Use StringIO to treat the string as a file-like object f = StringIO(line) reader = csv.reader(f) # Read one row from the CSV reader return next(reader) # Example usage: line = "Value1,value,with,commas,value3" parsed_line = parse_csv_line(line) print(parsed_line) # Output: ['value1', 'value, with,commas', 'value3'] ### Explanation: 1. **StringIO**: This is used to create an in-memory file-like object from the string 'line'. The 'csv.reader' expects a file-like object. 2. **csv.reader**: This function reads the CSV data, properly handling quoted fields, commas within quotes, and other edge cases. 3. **next(reader)**: This retrieves the first (and in this case, the only) row from the reader.
Chat Data	This approach ensures that fields enclosed in quotes are properly handled, and commas within those quotes are not treated as delimiters.	Chat Data	This implementation should correctly parse lines with quoted fields and handle commas inside quotes without any issues.

In this case both models return similar changes that do the same thing and explain it in similar fashions.

8.2

Number	8	Number	8
Type	Few-shot	Type	Fewshot
Goal	CSV Parser Variants (Python)	Goal	CSV Parser Variants (Python)
Model	Codestratal 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7 Token Limit: 1024 Top-P: .9		Temperature: .7 Token Limit: 1024 Top-P: .9	
	Below are examples of how to improve a simple CSV-line parser to correctly handle quoted fields (including commas inside quotes). *** Example 1 **Input:** python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields ... ***Improved Output:** python import re def parse_csv_line(line): # Split on commas not enclosed in double quotes pattern = re.compile(r"(?:"",") [^","]* [","]+[^","]+)") fields = pattern.findall(line) return [f.strip() for f in fields] ... *** Example 2 **Input:** python def parse_csv_line(line): parts = [] for token in line.split(','): # Incomplete: doesn't handle quoted fields parts.append(token) return parts ... ***Improved Output:** python def parse_csv_line(line): fields = [] field, in_quotes = "", False for char in line: if char == ",": in_quotes = not in_quotes elif char == '\"': in_quotes = not in_quotes else: if in_quotes: field += char else: field = field + char fields.append(field) return [f.strip() for f in fields] ... Now it's your turn. **Task:** Improve the parser to support quoted fields: python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields ... Produce a version that: 1. Splits on commas **only** when they're not inside double quotes. 2. Strips any surrounding quotes from each field. 		Preview Chat Code Raw SauravBanerjee04 now Below are examples of how to improve a simple CSV-line parser to correctly handle quoted fields (including commas inside quotes). Example 1 Input: Python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields Improved Output: Python import re def parse_csv_line(line): # Split on commas not enclosed in double quotes pattern = re.compile(r"(?:"",") [^","]* [","]+[^","]+)") fields = pattern.findall(line) return [f.strip() for f in fields] Example 2 Input: Python def parse_csv_line(line): # Split on commas not enclosed in double quotes pattern = re.compile(r"(?:"",") [^","]* [","]+[^","]+)") fields = pattern.findall(line) return [f.strip() for f in fields] Improved Output: Python def parse_csv_line(line): parts = [] for token in line.split(','): # Incomplete: doesn't handle quoted fields parts.append(token) return parts Improved Output: Python def parse_csv_line(line): fields = [] field, in_quotes = "", False for char in line: if char == ",": in_quotes = not in_quotes elif char == '\"': in_quotes = not in_quotes else: if in_quotes: field += char else: field = field + char fields.append(field) return [f.strip() for f in fields] Example 3 Input: Python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields Improved Output: Python def parse_csv_line(line): fields, cur, quote = [], "" for ch in line: if ch == ",": quote = not quote elif ch == '\"': quote = not quote elif quote == "" and not cur: fields.append(cur) cur = "" continue cur += ch fields.append(cur) return [f.strip() for f in fields] ... Now it's your turn. **Task:** Improve the parser to support quoted fields: python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields ... Produce a version that: 1. Splits on commas **only** when they're not inside double quotes. 2. Strips any surrounding quotes from each field.

<pre> [{"timestamp": "2025-04-28T09:29:46.312Z", "role": "user", "message": "Below are examples of how to improve a simple CSV-line parser to correctly handle quoted fields (including commas inside quotes)."}, ### Example 1 **Input:** python def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields **Improved Output:** python import re def parse_csv_line(line): # Split on commas not enclosed in double quotes pattern = re.compile(r'(([^",\n] "(\\\" \\' \\' \\")*)') fields = pattern.findall(line) return [f.strip('"') for f in fields] ### Example 2 **Input:** python def parse_csv_line(): parts = [] for token in line.split(','): parts.append(token) return parts ``` **Improved Output:** python def parse_csv_line(): fields = [] field = "" in_quotes = False for char in line: if char == '"': in_quotes = not in_quotes # Toggle the in_quotes flag elif char == ',' and not in_quotes: fields.append(field) field = "" else: field += char fields.append(field) # Add the last field, stripping quotes return fields </pre>	<p>continue cur += ch fields.append(cur) return [f.strip("") for f in fields] Now it's your turn.</p> <p>Task: Improve the parser to support quoted fields:</p> <p>Python</p> <pre> def parse_csv_line(line): return line.split(',') # Incomplete: doesn't handle quoted fields </pre> <p>Produce a version that:</p> <p>Splits on commas only when they're not inside double quotes. Strips any surrounding quotes from each field. OpenAI logo OpenAI GPT-4o mini now</p> <p>To improve the CSV line parser to handle quoted fields correctly, we can use a loop to iterate through each character in the input line. We will keep track of whether we are currently inside quotes and only split on commas that are outside of quotes. We will also strip any surrounding quotes from each field after we have finished parsing. Here's the improved version:</p> <p>Python</p> <pre> def parse_csv_line(line): fields = [] field = "" in_quotes = False for char in line: if char == '"': in_quotes = not in_quotes # Toggle the in_quotes flag elif char == ',' and not in_quotes: fields.append(field) field = "" else: field += char fields.append(field) # Add the last field, stripping quotes return fields </pre>
Chat Data	Chat Data

Both models actually end up returning similar answers here with a similar way of parsing the csv.

9.1

Number	9	Number	9
Type	Zero-Shot	Type	Zero-Shot
Goal	Data Class to API Conversion (Kotlin)	Goal	Data Class to API Conversion (Kotlin)
Model	Codestral 25.01 Transcript	Model	OpenAI GPT-4o mini
Temperature: .7 Token Limit: 1024 Top-P .9	Convert the data class to a REST API using Ktor: \data class Product(val id: Int, val name: String, val price: Double) // TODO: Create GET and POST endpoints using Ktor^ To create a REST API using Ktor for the 'Product' data class, you'll need to set up a Ktor application with the necessary endpoints for GET and POST requests. Below is a step-by-step guide to achieve this: 1. **Set up your Ktor project**: If you haven't already, create a new Ktor project. You can use the Ktor project generator or set it up manually. 2. **Add necessary dependencies**: Ensure you have the Ktor server and JSON dependencies in your 'build.gradle.kts' file. 3. **Create the 'Product' data class**: Define your 'Product' data class. 4. **Set up the Ktor application**: Create the Ktor application and define the GET and POST endpoints. Here's a complete example: ### 1. build.gradle.kts ```kotlin plugins { kotlin("jvm") version "1.6.21" id("io.ktor.plugin") version "2.0.0" } repositories { mavenCentral() } dependencies { implementation("io.ktor:ktor-server-core:2.0.0") implementation("io.ktor:ktor-client-core:2.0.0") implementation("io.ktor:ktor-server-content-negotiation:2.0.0") implementation("io.ktor:ktor-serialization-jackson:2.0.0") implementation("org.jetbrains.kotlinx:kotlinx-serialization-json:1.3.2") testImplementation("kotlinx:test") }	Convert the data class to a REST API using Ktor: \data class Product(val id: Int, val name: String, val price: Double) // TODO: Create GET and POST endpoints using Ktor^ To create a REST API using Ktor for the 'Product' data class, we can follow these steps: 1. Set up a Ktor project. 2. Define the 'Product' data class. 3. Create GET and POST endpoints for managing products. Below is an example of how to implement this using Ktor. ### Step 1: Set up a Ktor Project Make sure you have Ktor dependencies in your 'build.gradle.kts' file: ```kotlin dependencies { implementation("io.ktor:ktor-server-core:2.0.0") implementation("io.ktor:ktor-client-core:2.0.0") implementation("io.ktor:ktor-server-content-negotiation:2.0.0") implementation("io.ktor:ktor-serialization-jackson:2.0.0") implementation("org.jetbrains.kotlinx:kotlinx-serialization-json:1.3.2") testImplementation("kotlinx:test") }	

```
    testImplementation(kotlin("test"))
}

kotlin {
    jvmToolchain(11)
}

application {
    mainClass.set("com.example.ApplicationKt")
}
...

### 2. 'Product.kt'
```
kotlin
import kotlinx.serialization.Serializable

@Serializable
data class Product(val id: Int, val name: String, val price: Double)
```

### 3. 'Application.kt'
```
kotlin
import io.ktor.application.*
import io.ktor.features.*
import io.ktor.http.*
import io.ktor.request.*
import io.ktor.response.*
import io.ktor.routing.*
import io.ktor.serialization.*
import io.ktor.server.engine.*
import io.ktor.server.netty.*

fun main() {
 embeddedServer(Netty, port = 8080, module = Application::module)
 .start(wait = true)
}

fun Application.module() {
 install(ContentNegotiation) {
 json()
 }

 val products = mutableListOf<Product>()

 routing {
 // GET all products
 get("/products") {
 mutex.withLock {
 call.respond(products)
 }
 }
 }
}
```

```

...
Step 2: Define the Product Data Class
You already have the 'Product' data class:
```kotlin  
data class Product(val id: Int, val name: String, val price: Double)  
```  
Step 3: Create GET and POST Endpoints
Now let's implement the Ktor application with the necessary endpoints.
```kotlin  
import io.ktor.application.\*  
import io.ktor.http.\*  
import io.ktor.response.\*  
import io.ktor.routing.\*  
import io.ktor.serialization.\*  
import io.ktorserver.engine.\*  
import io.ktorserver.netty.\*  
import io.ktor.features.ContentNegotiation  
import io.ktor.serialization.json.\*  
import io.ktor.request.receive  
import kotlin.coroutines.sync.Mutex  
import kotlin.coroutines.sync.withLock  
  
// In-memory storage for products  
val products = mutableListOf<Product>()  
val mutex = Mutex()  
  
fun main() {  
 embeddedServer(Netty, port = 8080) {  
 install(ContentNegotiation) {  
 json() // Enable JSON serialization  
 }  
 routing {  
 get("/products") {  
 mutex.withLock {  
 call.respond(products)  
 }
 }
 }
 }
}

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <pre> get("/products") {     call.respond(products) }  post("/products") {     val product = call.receive&lt;Product&gt;()     products.add(product)     call.respondText("Product stored correctly", status = HttpStatusCode.Created) } }  ### Explanation  1. **Dependencies**: The 'build.gradle.kts' file includes dependencies for Ktor server, content negotiation, and JSON serialization.  2. **Product Data Class**: The 'Product' data class is marked with '@Serializable' to support JSON serialization.  3. **Ktor Application**:   - The `main` function sets up an embedded Netty server on port 8080.   - The `ContentNegotiation` function configures the Ktor application.   - 'ContentNegotiation': Is installed to support JSON serialization.   - 'products': A mutable list is used to store 'Product' instances.   - Two routes are defined:     - 'GET /products': Responds with the list of products.     - 'POST /products': Receives a 'Product' instance from the request body, adds it to the list, and responds with a success message.  ### Running the Application: 1. Build and run your project using Gradle: ```sh ./gradlew run ``` 2. You can now test the API using tools like 'curl', Postman, or any HTTP client.    - **GET Request**: ```sh curl -X GET http://localhost:8080/products ```   - **POST Request**: ```sh curl -X POST http://localhost:8080/products -H "Content-Type: application/json" -d '{"id": 1, "name": "Example", "price": 9.99}' ``` </pre> | Chat Data | <pre> // POST a new product post("/products") {     val product = call.receive&lt;Product&gt;()     mutex.withLock {         products.add(product)     }     call.respond(HttpStatusCode.Created, product) } }  ### Explanation  1. **In-memory Storage**: We use a mutable list 'products' to store the products in memory. A 'Mutex' is used for thread safety since Ktor can handle multiple requests concurrently.  2. **GET Endpoint**: The GET endpoint '/products' accepts a 'Product' object in the request body, adds it to the list, and responds with the created product and a '201 Created' status.  ### Running the Application  To run the application: 1. Ensure you have the necessary Ktor dependencies in your project. 2. Run the main function, which will start the server on port 8080. 3. You can test the endpoints using tools like Postman or curl.  ### Example Requests  - **GET all products**: ```bash curl http://localhost:8080/products ``` - **POST a new product**: ```bash curl -X POST http://localhost:8080/products -H "Content-Type: application/json" -d '{"id": 1, "name": "Product A", "price": 10.99}' ``` </pre> | Chat Data |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|

Both codes produce similar outputs doing the same thing, although Codestral's output is a little longer.

## 9.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                            |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---|------|----------|------|---------------------------------------|-------|----------------------------|--------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|------|----------|------|---------------------------------------|-------|--------------------|--------------------------------------------|--------------------------------------------|
| <table border="1"> <tr> <td>Number</td><td>9</td></tr> <tr> <td>Type</td><td>Few-shot</td></tr> <tr> <td>Goal</td><td>Data Class to API Conversion (Kotlin)</td></tr> <tr> <td>Model</td><td>Codestral 25.01 Transcript</td></tr> <tr> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td><td>Temperature: 7 Token Limit: 1024 Top-P: .9</td></tr> </table> <pre> Here are some examples: ### Example 1 **Prompt:** Convert the data class to a REST API using Ktor:  data class User(val id: Int, val username: String, val email: String)  // TODO: Create GET and POST endpoints using Ktor ...  **Answer:** ``` kotlin import io.ktor.application.* import io.ktor.response.* import io.ktor.request.* import io.ktor.routing.* import io.ktor.http.* import io.ktor.server.engine.* import io.ktor.server.netty.*  data class User(val id: Int, val username: String, val email: String)  fun main() {     embeddedServer(Netty, port = 8080) {         routing {             route("/users") {                 get {                     call.respond(HttpStatusCode.OK, listOf(User(1, "john_doe", "john@example.com")))                 }                 post {                     val user = call.receive&lt;User&gt;()                     call.respond(HttpStatusCode.Created, user)                 }             }         }.start(wait = true)     } } ``` </pre>                                 | Number                                     | 9 | Type | Few-shot | Goal | Data Class to API Conversion (Kotlin) | Model | Codestral 25.01 Transcript | Temperature: 7 Token Limit: 1024 Top-P: .9 | Temperature: 7 Token Limit: 1024 Top-P: .9 | <table border="1"> <tr> <td>Number</td><td>9</td></tr> <tr> <td>Type</td><td>Few-shot</td></tr> <tr> <td>Goal</td><td>Data Class to API Conversion (Kotlin)</td></tr> <tr> <td>Model</td><td>OpenAI GPT-40 mini</td></tr> <tr> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td><td>Temperature: 7 Token Limit: 1024 Top-P: .9</td></tr> </table> <pre> Here are some examples: ### Example 1 **Prompt:** Convert the data class to a REST API using Ktor:  data class User(val id: Int, val username: String, val email: String)  // TODO: Create GET and POST endpoints using Ktor ...  **Answer:** ``` kotlin import io.ktor.application.* import io.ktor.response.* import io.ktor.request.* import io.ktor.routing.* import io.ktor.http.* import io.ktor.server.engine.* import io.ktor.server.netty.*  data class User(val id: Int, val username: String, val email: String)  fun main() {     embeddedServer(Netty, port = 8080) {         routing {             route("/users") {                 get {                     call.respond(HttpStatusCode.OK, listOf(User(1, "john_doe", "john@example.com")))                 }                 post {                     val user = call.receive&lt;User&gt;()                     call.respond(HttpStatusCode.Created, user)                 }             }         }.start(wait = true)     } } ``` </pre>                                 | Number | 9 | Type | Few-shot | Goal | Data Class to API Conversion (Kotlin) | Model | OpenAI GPT-40 mini | Temperature: 7 Token Limit: 1024 Top-P: .9 | Temperature: 7 Token Limit: 1024 Top-P: .9 |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9                                          |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Few-shot                                   |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Class to API Conversion (Kotlin)      |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestral 25.01 Transcript                 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Temperature: 7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: 7 Token Limit: 1024 Top-P: .9 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9                                          |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Few-shot                                   |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Class to API Conversion (Kotlin)      |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-40 mini                         |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Temperature: 7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: 7 Token Limit: 1024 Top-P: .9 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| <table border="1"> <tr> <td>Number</td> <td>9</td> </tr> <tr> <td>Type</td> <td>Few-shot</td> </tr> <tr> <td>Goal</td> <td>Data Class to API Conversion (Kotlin)</td> </tr> <tr> <td>Model</td> <td>Codestral 25.01 Transcript</td> </tr> <tr> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td> </tr> </table> <pre> ### Example 2 **Prompt:** Convert the data class to a REST API using Ktor:  data class Book(val id: Int, val title: String, val author: String, val publishedYear: Int) ...  // TODO: Create GET and POST endpoints using Ktor ...  **Answer:** ``` kotlin import io.ktor.application.* import io.ktor.response.* import io.ktor.request.* import io.ktor.routing.* import io.ktor.http.* import io.ktor.server.engine.* import io.ktor.server.netty.*  data class Book(val id: Int, val title: String, val author: String, val publishedYear: Int)  fun main() {     embeddedServer(Netty, port = 8081) {         routing {             route("books") {                 get {                     call.respond(HttpStatusCode.OK, listOf(Book(1, "1984", "George Orwell", 1949)))                 }                 post {                     val book = call.receive&lt;Book&gt;()                     call.respond(HttpStatusCode.Created, book)                 }             }         }.start(wait = true)     } } ``` </pre> | Number                                     | 9 | Type | Few-shot | Goal | Data Class to API Conversion (Kotlin) | Model | Codestral 25.01 Transcript | Temperature: 7 Token Limit: 1024 Top-P: .9 | Temperature: 7 Token Limit: 1024 Top-P: .9 | <table border="1"> <tr> <td>Number</td> <td>9</td> </tr> <tr> <td>Type</td> <td>Few-shot</td> </tr> <tr> <td>Goal</td> <td>Data Class to API Conversion (Kotlin)</td> </tr> <tr> <td>Model</td> <td>OpenAI GPT-40 mini</td> </tr> <tr> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td> <td>Temperature: 7 Token Limit: 1024 Top-P: .9</td> </tr> </table> <pre> ### Example 2 **Prompt:** Convert the data class to a REST API using Ktor:  data class Book(val id: Int, val title: String, val author: String, val publishedYear: Int) ...  // TODO: Create GET and POST endpoints using Ktor ...  **Answer:** ``` kotlin import io.ktor.application.* import io.ktor.response.* import io.ktor.request.* import io.ktor.routing.* import io.ktor.http.* import io.ktor.server.engine.* import io.ktor.server.netty.*  data class Book(val id: Int, val title: String, val author: String, val publishedYear: Int)  fun main() {     embeddedServer(Netty, port = 8081) {         routing {             route("books") {                 get {                     call.respond(HttpStatusCode.OK, listOf(Book(1, "1984", "George Orwell", 1949)))                 }                 post {                     val book = call.receive&lt;Book&gt;()                     call.respond(HttpStatusCode.Created, book)                 }             }         }.start(wait = true)     } } ``` </pre> | Number | 9 | Type | Few-shot | Goal | Data Class to API Conversion (Kotlin) | Model | OpenAI GPT-40 mini | Temperature: 7 Token Limit: 1024 Top-P: .9 | Temperature: 7 Token Limit: 1024 Top-P: .9 |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9                                          |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Few-shot                                   |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Class to API Conversion (Kotlin)      |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestral 25.01 Transcript                 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Temperature: 7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: 7 Token Limit: 1024 Top-P: .9 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9                                          |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Few-shot                                   |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Class to API Conversion (Kotlin)      |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-40 mini                         |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |
| Temperature: 7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: 7 Token Limit: 1024 Top-P: .9 |   |      |          |      |                                       |       |                            |                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |   |      |          |      |                                       |       |                    |                                            |                                            |

```

import io.ktor.application.*
import io.ktor.response.*
import io.ktor.routing.*
import io.ktor.http.*
import io.ktor.server.engine.*
import io.ktor.server.netty.*

data class Order(val orderId: Int, val product: String, val quantity: Int, val price: Double)

fun main() {
 embeddedServer(Netty, port = 8082) {
 routing {
 route("orders") {
 get {
 call.respond(HttpStatusCode.OK, listOf(Order(1001, "Laptop", 2, 1500.0)))
 }
 post {
 val order = call.receive<Order>()
 call.respond(HttpStatusCode.Created, order)
 }
 }
 }.start(wait = true)
 }
}

Now convert the data class to a REST API using Ktor:
`data class Product(val id: Int, val name: String, val price: Double)`

// TODO: Create GET and POST endpoints using Ktor

[{"timestamp": "2025-04-28T09:30:39.000Z", "role": "assistant", "message": "Here are some examples: \n\n### Example 1\n\n**Prompt:** Convert the data class to a REST API using Ktor:\n\n"}, {"timestamp": "2025-04-28T09:30:45.052Z", "role": "assistant", "message": "Now convert the data class to a REST API using Ktor:\n`data class Product(val id: Int, val name: String, val price: Double)`\n\n// TODO: Create GET and POST endpoints using Ktor\n\n"}]

```

Chat Data

Chat Data

In this case both codes end up with similar code outputs with Codestral giving a bit longer of an explanation at the end.

## 10.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 10                              | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 10                              |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Zero-Shot                       | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Zero-Shot                       |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Function Summarization (Python) | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Function Summarization (Python) |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Codestral 25.01 Transcript      | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | OpenAI GPT-4o mini              |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                 |
| Write a brief summary of the function:<br>```<br>def reverse_words(sentence):<br>return ''.join(sentence.split()[::-1])<br>```<br><br>The function `reverse_words(sentence)` takes a single argument `sentence`, which is a string. Here's a brief summary of what the function does:<br><br>1. **Splits the Sentence**: It splits the input string `sentence` into a list of words using the `split()` method. By default, `split()` divides the string at whitespace and removes any extra spaces.<br>2. **Reverses the List**: It then reverses the list of words using slicing `[::-1]`.<br>3. **Joins the Words**: Finally, it joins the reversed list of words back into a single string with spaces in between each word using the `join()` method.<br>4. **Returns the Result**: The function returns the new string, which is the original sentence with the words reversed.<br><br>### Example:<br>If you call `reverse_words("hello world")`, the function will return "world hello". |                                 | Write a brief summary of the function:<br>```<br>def reverse_words(sentence):<br>return ''.join(sentence.split()[::-1])<br>```<br><br>The function `reverse_words(sentence)` takes a string input `sentence`, splits it into individual words, reverses the order of those words, and then joins them back together into a single string. The resulting string contains the words from the original sentence in reverse order, with a single space separating each word. For example, if the input is "Hello world", the output will be "world Hello". |                                 |

Chat Data

Chat Data

Codestral's summary is a bit deeper in explanation of the coding process, while the GPT-4's explanation is more surface level in regards to how the code works and explains more about what it does.

## 10.2

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                               | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Number                                        | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Type                                                 | Self-Consistency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Type                                          | Self-Consistency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Goal                                                 | Function Summarization (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Goal                                          | Function Summarization (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Model                                                | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Model                                         | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Temperature: .7 Token Limit:<br>1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Chat Data                                            | <pre>Write a brief summary of the function: ``` def reverse_words(sentence):     return ''.join(sentence.split()[::-1]) ```  The 'reverse_words' function takes a sentence as input and returns the sentence with the order of the words reversed. Here's a brief summary of how it works:  1. **Splitting the Sentence**: The function first splits the input sentence into individual words using the 'split()' method, which divides the string at each whitespace and returns a list of words. 2. **Reversing the List**: It then reverses the order of the words in the list using slicing '[::-1]'. This slicing technique creates a new list that is the reverse of the original list. 3. **Joining the Words**: Finally, the function joins the reversed list of words back into a single string, with each word separated by a space, using the 'join()' method.  In essence, the function takes a sentence and returns a new sentence where the words are in the opposite order. For example, if the input is "hello world", the output will be "world hello".</pre> | Chat Data                                     | <pre>Write a brief summary of the function: ``` def reverse_words(sentence):     return ''.join(sentence.split()[::-1]) ```  The function 'reverse_words(sentence)' takes a string input 'sentence' and returns a new string with the words in reverse order. It works by splitting the input sentence into a list of words using the 'split()' method, which separates the string by whitespace. The list of words is then reversed using slicing '[::-1]', and finally, the reversed list is joined back into a single string with spaces in between using ''.join(')'.</pre> |

In this case both codes return similar output but just have differences in the way it is presented.

## 11.1

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                               | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Number                                        | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Type                                                 | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Type                                          | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Goal                                                 | Prompt from Code Comments (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Goal                                          | Prompt from Code Comments (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Model                                                | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Model                                         | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Temperature: .7 Token Limit:<br>1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Chat Data                                            | <pre>Can you generate a python function that returns whether or not a function is prime (call it is_prime(n))  Your function is almost correct, but there are a few syntax issues. Here is the corrected version of the 'is_prime' function:  ```python def is_prime(n):     if n &lt;= 1:         return False      for i in range(2, int(n**0.5) + 1):         if n % i == 0:             return False      return True ```  ### Explanation: 1. **Check for numbers less than or equal to 1**: Numbers less than or equal to 1 are not prime. 2. **Loop through potential factors**: The loop runs from 2 to the integer square root of 'n' (inclusive). This is because a larger factor of 'n' must be a multiple of a smaller factor that has already been checked. 3. **Check divisibility**: If 'n' is divisible by any number in this range, it is not a prime number. 4. **Return True if no divisors are found**: If no divisors are found, 'n' is a prime number.  ### Example Usage: ```python print(is_prime(11)) # True print(is_prime(4)) # False print(is_prime(17)) # True print(is_prime(1)) # False ```  This function should work correctly for most use cases. However, if you need to handle large numbers efficiently, you might want to consider more advanced algorithms like the Miller-Rabin primality test.</pre> | Chat Data                                     | <pre>Can you generate a python function that returns whether or not a function is prime (call it is_prime(n))  Certainly! It looks like you have the basic structure of the 'is_prime' function, but there are some indentation issues and a couple of minor improvements that can be made. Here's a corrected and formatted version of the 'is_prime' function:  ```python def is_prime(n):     """Check if a number is prime."""     if n &lt;= 1:         return False # Numbers &lt;= 1 are not prime      for i in range(2, int(n**0.5) + 1): # Check divisors from 2 to sqrt(n)         if n % i == 0:             return False # Found a divisor, so n is not prime      return True # No divisors found, so n is prime ```  ### Explanation: 1. **Check for numbers less than or equal to 1**: The function first checks if 'n' is less than or equal to 1. If so, it returns 'False' because numbers less than or equal to 1 are not prime. 2. **Loop through potential factors**: It then iterates from 2 to the square root of 'n'. If any number divides 'n' evenly ('n % i == 0'), then 'n' is not prime, and the function returns 'False'. 3. **Return True**: If no divisors are found in the loop, the function concludes that 'n' is prime and returns 'True'.  You can use this function like this:  ```python print(is_prime(5)) # Output: True print(is_prime(10)) # Output: False print(is_prime(17)) # Output: True print(is_prime(1)) # Output: False ```  This will correctly determine if the numbers 5, 10, 17, and 1 are prime.</pre> |

Both codes end up generating the same function, probably because it's from a training set from the internet somewhere.

## 11.2

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                               | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Number                                        | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Type                                                 | Chain-of-thought                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Type                                          | Chain-of-thought                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Goal                                                 | Prompt from Code Comments (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Goal                                          | Prompt from Code Comments (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Model                                                | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Model                                         | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Temperature: .7 Token Limit:<br>1024 Top-P .9 | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Chat Data                                            | <pre>Can you work step-by-step to generate a python function that returns whether or not a function is prime (call it is_prime(n))  [ {   "timestamp": "2025-04-28T09:31:19.616Z",   "role": "user",   "message": "Can you work step-by-step to generate a python function that returns whether or not a function is prime (call it is_prime(n))" }, {   "timestamp": "2025-04-28T09:31:28.398Z",   "role": "assistant",   "message": "Certainly! Let's go through the process step-by-step to create a function that checks if a number is prime.  ### Step-by-Step Process 1. **Understand Prime Numbers**:    - A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.  2. **Basic Approach**:    - For a number <math>n</math>, check if it has any divisors other than 1 and <math>n</math> itself.  3. **Edge Cases**:    - Handle numbers less than 2 (since they are not prime).    - Handle the number 2, which is the smallest prime number.  4. **Efficient Algorithm**:    - Only check divisors from 2 up to the square root of <math>n</math>. If <math>n</math> has divisors in this range, it is not prime.  ### Python Function Implementation Let's write the function 'is_prime(n)' step-by-step.  ```python def is_prime(n):     # Step 1: Handle edge cases     if n &lt;= 1:         return False ```  </pre> | Chat Data                                     | <pre>Can you work step-by-step to generate a python function that returns whether or not a function is prime (call it is_prime(n))  [ {   "timestamp": "2025-04-28T09:31:24.096Z",   "role": "user",   "message": "Can you work step-by-step to generate a python function that returns whether or not a function is prime (call it is_prime(n))" }, {   "timestamp": "2025-04-28T09:31:33.507Z",   "role": "assistant",   "message": "Certainly! To create a Python function called 'is_prime(n)' that checks whether a number <math>n</math> is prime, we need to follow some steps and outline the logic we will use.  ### Steps to Create 'is_prime(n)' 1. **Understanding Prime Numbers**: A prime number is greater than 1 and has no positive divisors other than 1 and itself. 2. **Basic Cases**:    - If <math>n</math> is 1, return 'False' (0 and 1 are not prime).    - If <math>n</math> is 2, return 'True' (2 is the only even prime number).    - If <math>n</math> is greater than 2 and even, return 'False' (all other even numbers are not prime). 3. **Check Odd Divisors**: For odd <math>n</math> greater than 2, check for divisibility from 3 up to the square root of <math>n</math>.    - If <math>n</math> is divisible by any of these numbers, it is not prime. 4. **Return Result**: If no divisors are found, return 'True'.  ### Implementation </pre> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> if n &lt;= 1:     return False if n == 2:     return True  # Step 2: Check for factors from 2 to the square root of n for i in range(2, int(n**0.5) + 1):     if n % i == 0:         return False  # Step 3: If no factors found, n is prime return True  # Test the function print(is_prime(2)) # True print(is_prime(3)) # True print(is_prime(4)) # False print(is_prime(17)) # True print(is_prime(18)) # False ... </pre> <p>### Explanation of the Code</p> <ol style="list-style-type: none"> <li>1. **Edge Case Handling**:<br/>- If <math>n \leq 1</math>: return False. Numbers less than or equal to 1 are not prime.<br/>- If <math>n == 2</math>: return True. The number 2 is a prime number.</li> <li>2. **Loop to Check Divisors**:<br/>- for <math>i</math> in range(2, <math>\text{int}(n^{0.5}) + 1</math>): Loop from 2 to the square root of <math>\lfloor n \rfloor</math>.<br/>- If <math>n \% i == 0</math>: return False. If <math>\lfloor n \rfloor</math> is divisible by any <math>\lfloor i \rfloor</math>, it is not prime.</li> <li>3. **Return True if No Divisors Found**:<br/>- If the loop completes without finding any divisors, <math>\lfloor n \rfloor</math> is prime.</li> </ol> <p>### Testing the Function</p> <p>We tested the function with various numbers to ensure it works correctly:</p> <ul style="list-style-type: none"> <li>- <code>is_prime(2)</code> returns 'True' (2 is prime).</li> <li>- <code>is_prime(3)</code> returns 'True' (3 is prime).</li> <li>- <code>is_prime(4)</code> returns 'False' (4 is not prime).</li> <li>- <code>is_prime(17)</code> returns 'True' (17 is prime).</li> <li>- <code>is_prime(18)</code> returns 'False' (18 is not prime).</li> </ul> <p>This function should work efficiently for checking if a number is prime.</p> | <p>Here is the code implementing these steps:</p> <pre> '''python def is_prime(n):     # Basic cases     if n == 1:         return False     if n == 2:         return True # 2 is prime      if n % 2 == 0:         return False # All other even numbers are not prime      # Check odd divisors from 3 to sqrt(n)     for i in range(3, int(n**0.5) + 1, 2):         if n % i == 0:             return False # Found a divisor, not prime      return True # No divisors found, n is prime </pre> <p>### Explanation of the Code</p> <ol style="list-style-type: none"> <li>1. The function starts by checking if the input <math>n</math> is less than or equal to 1, in which case it returns 'False'.</li> <li>2. If <math>n \leq 1</math> is empty, 2, it returns 'True' since 2 is prime.</li> <li>3. It checks if <math>\lfloor n \rfloor</math> is even (other than 2), in which case it returns 'False'.</li> <li>4. For odd numbers greater than 2, it checks for factors starting from 3 up to the integer value of the square root of <math>\lfloor n \rfloor</math>. The <code>range(3, <math>\text{int}(n^{0.5}) + 1, 2</math>)</code> generates odd numbers only (by stepping 2).</li> <li>5. If any factor is found during the loop, it returns 'False'.</li> <li>6. If no factors are found, it concludes that <math>\lfloor n \rfloor</math> is prime and returns 'True'.</li> </ol> <p>### Usage</p> <p>You can use the function like this:</p> <pre> '''python print(is_prime(11)) # Output: True print(is_prime(4)) # Output: False print(is_prime(13)) # Output: True print(is_prime(1)) # Output: False ... </pre> <p>This function efficiently checks for prime numbers and should work well for reasonably sized integers."</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In this case, the codes return different methods, probably because they're using their own logic to think about it instead of looking through what it was trained on.

## 12.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Number   12</p> <p>Type   Zero-Shot</p> <p>Goal   Fixing Factorial Bug (Python)</p> <p>Model   Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Fix the bug when input is 0: """ def factorial(n):     result = 1     for i in range(1, n):         result *= i     return result """  The provided code for the 'factorial' function has a indentation issue. Additionally, the range should include 'n' to ensure that 'n' itself is multiplied in the factorial calculation. Here is the corrected version of the function:  '''python def factorial(n):     result = 1     for i in range(1, n + 1):         result *= i     return result '''  This ensures that the factorial calculation is correct for all non-negative integers, including '0'. The factorial of '0' is defined to be '1'.  Here's a brief explanation of the changes: 1. Fixed the indentation issue in the 'for' loop. 2. Changed the range to 'range(1, n + 1)' to include 'n' in the multiplication.  With these changes, the function will correctly compute the factorial for any non-negative integer 'n', including handling the input '0' correctly. </pre> | <p>Number   12</p> <p>Type   Zero-Shot</p> <p>Goal   Fixing Factorial Bug (Python)</p> <p>Model   OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Fix the bug when input is 0: """ def factorial(n):     result = 1     for i in range(1, n):         result *= i     return result """  The issue with your 'factorial' function is that it does not correctly handle the case when the input 'n' is '0'. By definition, the factorial of '0' (0!) is '1'. Additionally, there are some indentation issues in your code. Here's the corrected version of the function:  '''python def factorial(n):     if n == 0:         return 1     result = 1     for i in range(1, n + 1): # Change range to include n         result *= i     return result '''  ### Key Changes: 1. "Handle the case when 'n' is '0'": Added a check at the beginning of the function to return '1' if 'n' is '0'. 2. "Corrected the loop range": Changed 'range(1, n)' to 'range(1, n + 1)' to include 'n' in the multiplication. 3. "Fixed indentation": Ensured that the lines inside the function are properly indented.  Now, the function will work correctly for all non-negative integers, including '0'. </pre> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Both outputs handle the exception, but in this case do it in different ways.

## 12.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Number   12</p> <p>Type   Self-Consistency</p> <p>Goal   Fixing Factorial Bug (Python)</p> <p>Model   Codestral 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Fix the bug when input is 0: """ def factorial(n):     result = 1     for i in range(1, n):         result *= i     return result """  The current implementation of the 'factorial' function has a few issues. Firstly, the indentation of the loop and the return statement is incorrect. Secondly, the range should include the number 'n' itself to correctly compute the factorial. Lastly, the loop should start from 1 and go up to 'n' inclusive.  Here is the corrected version of the 'factorial' function:  '''python def factorial(n):     if n &lt; 0:         raise ValueError("Factorial is not defined for negative numbers")     result = 1     for i in range(1, n + 1):         result *= i     return result '''  ### Explanation: 1. "Indentation": Ensure that the loop and the return statement are properly indented. 2. "Range": The range should be 'range(1, n + 1)' to include 'n' in the multiplication. 3. "Input Validation": Added a check to raise an error if the input is a negative number, as the factorial is not defined for negative numbers.  Chat Data </pre> | <p>Number   12</p> <p>Type   Self-Consistency</p> <p>Goal   Fixing Factorial Bug (Python)</p> <p>Model   OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top-P: .9</p> <pre> Fix the bug when input is 0: """ def factorial(n):     result = 1     for i in range(1, n):         result *= i     return result """  The bug in your factorial function arises from the way you are handling the input '0'. By definition, the factorial of '0' is '1'. Also, there is an issue with the indentation of the 'result *= i' line. Here's the corrected version of your function:  '''python def factorial(n):     if n == 0:         return 1     result = 1     for i in range(1, n + 1): # Adjust the range to include n         result *= i     return result '''  ### Key Changes: 1. Added a check for 'n == 0' to return '1'. 2. Changed the 'range(1, n)' to 'range(1, n + 1)' to include 'n' in the multiplication (the factorial of 'n' includes 'n' itself).  With these changes, the function will correctly compute the factorial of '0' as well as any positive integer 'n'. </pre> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In this case, the codes are different and the Codestral does one better and handles negative numbers as well.

## 13.1

|                                            |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
|--------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Number                                     | 13                                         | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
| Type                                       | Zero-Shot                                  | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
| Goal                                       | Linked List Node Deletion (C)              | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Linked List Node Deletion (C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
| Model                                      | Codestral 25.01 Transcript                 | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |
| Temperature: .7 Token Limit: 1024 Top-P .9 | Temperature: .7 Token Limit: 1024 Top-P .9 | Implement node deletion by value:<br>...<br>struct Node {<br>int data;<br>struct Node* next;<br>};<br><br>void deleteNode(struct Node** head, int key) {<br>// TODO: Implement node deletion<br>}<br><br>To implement the 'deleteNode' function for deleting a node by value in a singly linked list, you need to handle different cases such as the node being the head, in the middle, or the last node. Here is the complete implementation:<br>...<br>#include <stdio.h><br>#include <stdlib.h> | Implement node deletion by value:<br>...<br>struct Node {<br>int data;<br>struct Node* next;<br>};<br><br>void deleteNode(struct Node** head, int key) {<br>// TODO: Implement node deletion<br>}<br><br>To implement node deletion by value in a linked list, we need to traverse the list to find the node that contains the specified value (key) and then adjust the pointers to remove that node from the list. Here is how to implement the 'deleteNode' function:<br>...<br>#include <stdio.h><br>#include <stdlib.h><br><br>// Define the structure for a node in the linked list<br>struct Node {<br>int data;<br>struct Node* next;<br>};<br><br>// Function to delete a node with the specified key<br>void deleteNode(struct Node** head, int key) {<br>// Store the head node<br>struct Node* temp = *head;<br>struct Node* prev = NULL;<br><br>// If the head node itself holds the key to be deleted<br>if (temp != NULL && temp->data == key) {<br>*head = temp->next; // Change head<br>free(temp); // Free old head<br>return;<br>}<br><br>// Search for the key to be deleted, keep track of the previous node as we need to change 'prev->next'<br>while (temp != NULL && temp->data != key) {<br>prev = temp;<br>temp = temp->next;<br>}<br><br>// If key was not present in linked list<br>if (temp == NULL) return;<br><br>// Unlink the node from linked list<br>prev->next = temp->next;<br><br>free(temp); // Free memory<br>}<br><br>// Utility function to print the linked list<br>void printList(struct Node* node) {<br>while (node != NULL) {<br>printf("%d ", node->data);<br>node = node->next;<br>}<br>}<br><br>// Utility function to create a new node<br>struct Node* newNode(int data) {<br>struct Node* temp = (struct Node*)malloc(sizeof(struct Node));<br>temp->data = data;<br>temp->next = NULL;<br>return temp;<br>}<br><br>int main() {<br>// Create a linked list 10->20->30->40<br>struct Node* head = newNode(10);<br>head->next = newNode(20);<br>head->next->next = newNode(30);<br>head->next->next->next = newNode(40);<br><br>printf("Created Linked list is: ");<br>printList(head);<br><br>deleteNode(&head, 20); // Delete node with value 20<br><br>printf("Linked list after deletion of 20: ");<br>printList(head);<br><br>return 0;<br>}<br><br>### Explanation:<br>1. **Initial Check**: If the head node itself holds the key to be deleted, update the head to the next node and free the old head node.<br>2. **Search for Key**: Traverse the linked list to find the node with the given key.<br>- Keep track of the previous node to update its 'next' pointer.<br>- If the key is found, update the 'next' pointer of the previous node to skip the current node and free the current node.<br>3. **Utility Functions**:<br>- <code>printList</code> : To print the linked list.<br>- <code>newNode</code> : To create a new node.<br>- <code>main</code> : To test the <code>deleteNode</code> function.<br><br>This implementation ensures that the node with the specified value is removed from the linked list, handling edge cases such as deleting the head node and ensuring proper memory management. | Chat Data | Chat Data | Implement node deletion by value:<br>...<br>struct Node {<br>int data;<br>struct Node* next;<br>};<br><br>void deleteNode(struct Node** head, int key) {<br>// TODO: Implement node deletion<br>}<br><br>To implement node deletion by value in a linked list, we need to traverse the list to find the node that contains the specified value (key) and then adjust the pointers to remove that node from the list. Here is how to implement the 'deleteNode' function:<br>...<br>#include <stdio.h><br>#include <stdlib.h><br><br>// Define the structure for a node in the linked list<br>struct Node {<br>int data;<br>struct Node* next;<br>};<br><br>// Function to delete a node with the specified key<br>void deleteNode(struct Node** head, int key) {<br>// Store the head node<br>struct Node* temp = *head;<br>struct Node* prev = NULL;<br><br>// If the head node itself holds the key to be deleted<br>if (temp != NULL && temp->data == key) {<br>*head = temp->next; // Change head<br>free(temp); // Free old head<br>return;<br>}<br><br>// Search for the key to be deleted, keep track of the previous node<br>while (temp != NULL && temp->data != key) {<br>prev = temp;<br>temp = temp->next;<br>}<br><br>// If the key was not present in the linked list<br>if (temp == NULL) {<br>printf("Key %d not found in the list.\n", key);<br>return;<br>}<br><br>// Unlink the node from the linked list<br>prev->next = temp->next;<br><br>free(temp); // Free memory<br>}<br><br>// Utility function to create a new node<br>struct Node* newNode(int data) {<br>struct Node* new_node = (struct Node*)malloc(sizeof(struct Node));<br>new_node->data = data;<br>new_node->next = NULL;<br>return new_node;<br>}<br><br>// Utility function to print the linked list<br>void printList(struct Node* node) {<br>while (node != NULL) {<br>printf("%d -> ", node->data);<br>node = node->next;<br>}<br>printf("NULL\n");<br>}<br><br>// Example usage<br>int main() {<br>struct Node* head = newNode(1);<br>head->next = newNode(2);<br>head->next->next = newNode(3);<br><br>printList(head);<br><br>deleteNode(&head, 2); // Trying to delete a non-existent key<br><br>return 0;<br>}<br><br>### Explanation:<br>1. **Struct Definition**: We define a 'Node' struct that contains an integer 'data' and a pointer to the next node.<br>2. **`deleteNode` Function**:<br>- We take a double pointer to the head of the list and the key to be deleted.<br>- We check if the head itself contains the key. If yes, we change the head to point to the next node and free the old head.<br>- If the key is not at the head, we traverse the list while keeping track of the previous node.<br>- If we find the key, we unlink the node from the list by adjusting the 'next' pointer of the previous node.<br>- Finally, we free the memory of the deleted node.<br>3. **Utility Functions**:<br>- <code>newNode</code> creates a new node.<br>- <code>printList</code> prints the linked list.<br>4. **Main Function**: Demonstrates the usage of the linked list and the delete functionality.<br><br>This code handles deletion for both the head and other nodes, and it also manages the case where the key is not found in the list. | Chat Data |

Both models produce similar output here, and include a sample main method to show how it runs, which is nice.

13.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Number: 13</p> <p>Type: Self-Consistency</p> <p>Goal: Linked List Node Deletion (C)</p> <p>Model: Codestar 25.01 Transcript</p> <p>Temperature: .7 Token Limit: 1024 Top-P-.9</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Number: 13</p> <p>Type: Self-Consistency</p> <p>Goal: Linked List Node Deletion (C)</p> <p>Model: OpenAI GPT-4o mini</p> <p>Temperature: .7 Token Limit: 1024 Top-P-.9</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <pre>Implement node deletion by value: ``` struct Node {     int data;     struct Node* next; };  void deleteNode(struct Node** head, int key) {     // TODO: Implement node deletion } ```  Sure, I can help you implement the 'deleteNode' function to delete a node by value in a singly linked list. Here is the complete implementation:  ```c #include &lt;stdio.h&gt; #include &lt;stdlib.h&gt;  // Definition for singly-linked list node struct Node {     int data;     struct Node* next; };  void deleteNode(struct Node** head, int key) {     struct Node* temp = *head;     struct Node* prev = NULL;      if (*temp == NULL) {         return;     }      while (temp != NULL &amp;&amp; temp-&gt;data != key) {         prev = temp;         temp = temp-&gt;next;     }      if (temp == NULL) {         return;     }      if (temp-&gt;next == NULL) {         *head = temp-&gt;next;         free(temp);         return;     }      prev-&gt;next = temp-&gt;next;     free(temp); }  // Helper function to print the linked list void printList(struct Node* node) {     while (node != NULL) {         printf("%d ", node-&gt;data);         node = node-&gt;next;     }     printf("\n"); }  // Helper function to push a new node at the beginning of the list void push(struct Node** head, ref, int new_data) {     struct Node* new_node = (struct Node*)malloc(sizeof(struct Node));     new_node-&gt;data = new_data;     new_node-&gt;next = (*head);     (*head) = new_node; } ``` </pre> | <pre>Implement node deletion by value: ``` struct Node {     int data;     struct Node* next; };  void deleteNode(struct Node** head, int key) {     // TODO: Implement node deletion } ```  To implement node deletion by value in a linked list, we need to traverse the list to find the node with the specified value (key) and then remove it from the list. Below is the implementation of the 'deleteNode' function based on the provided 'Node' structure.  Here's the complete implementation:  ```c #include &lt;stdio.h&gt; #include &lt;stdlib.h&gt;  struct Node {     int data;     struct Node* next; };  // Function to delete a node by value (key) void deleteNode(struct Node** head, int key) {     struct Node* temp = *head;     struct Node* prev = NULL;      if (*temp == NULL) {         return;     }      while (temp != NULL &amp;&amp; temp-&gt;data != key) {         prev = temp;         temp = temp-&gt;next;     }      if (temp == NULL) {         return;     }      if (temp-&gt;next == NULL) {         *head = temp-&gt;next;         free(temp);         return;     }      prev-&gt;next = temp-&gt;next;     free(temp); }  // Search for the key to be deleted, keep track of the previous node while (temp != NULL &amp;&amp; temp-&gt;data != key) {     prev = temp;     temp = temp-&gt;next; }  // If the key was not present in the linked list if (temp == NULL) {     return; // Key not found }  // Unlink the node from the linked list prev-&gt;next = temp-&gt;next; free(temp); // Free memory  // Function to push a new node at the beginning of the list void push(struct Node** head, ref, int new_data) {     struct Node* new_node = (struct Node*)malloc(sizeof(struct Node));     new_node-&gt;data = new_data;     new_node-&gt;next = (*head);     (*head) = new_node; }  // Function to print linked list void printList(struct Node* node) {     while (node != NULL) {         printf("%d ", node-&gt;data);         node = node-&gt;next;     }     printf("\n"); }  // Example usage int main() {     struct Node* head = NULL;     push(&amp;head, 5);     push(&amp;head, 4);     printList(head);      // Create a linked list 1-&gt;2-&gt;3-&gt;4-&gt;5     push(&amp;head, 3);     push(&amp;head, 2);     push(&amp;head, 1);     push(&amp;head, 0);      // Print the list     printList(head);      // Delete the node with key 1     deleteNode(&amp;head, 1);     printList(head);      // Print the list after deletion of 1     printList(head);      // Delete the node with key 3     deleteNode(&amp;head, 3);     printList(head);      // Print the list after deletion of 3     printList(head);      // Delete the node with key 7     deleteNode(&amp;head, 7);     printList(head);      // Print the list after deletion of 7     printList(head);      return 0; } ``` </pre> |
| <p>Chat Data</p> <p>This implementation ensures that the node with the specified value is deleted from the linked list.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>Chat Data</p> <p>This implementation effectively handles the deletion of nodes in a singly linked list.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Both models produce similar output, although GPT-4o mini's output is a bit longer while explaining.

14.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14                                            | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 14                                     |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Zero-Shot                                     | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Zero-Shot                              |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Recursive Function Completion (Python)        | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Recursive Function Completion (Python) |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Codestral 25.01 Transcript                    | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OpenAI GPT-4o mini                     |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P-.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: .7 Token Limit:<br>1024 Top-P-.9 | Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Chat Data                              |
| <pre>"Complete the recursive function for Fibonacci: ``` def fibonacci():     # TODO: Base cases and recursive call     pass ```  Sure, I can help you complete the recursive function for Fibonacci. The Fibonacci sequence is defined as: - F(0) = 0 - F(1) = 1 - F(n) = F(n-1) + F(n-2) for n &gt;= 2  Here is the completed recursive function: ```python def fibonacci():     # Base cases     if n == 0:         return 0     elif n == 1:         return 1     # Recursive call     else:         return fibonacci(n - 1) + fibonacci(n - 2) ```  This function uses the base cases to handle the initial values of the Fibonacci sequence and then uses the recursive call to compute the Fibonacci numbers for n &gt;= 2 by summing the values of the two preceding numbers in the sequence.</pre> |                                               | <pre>"Complete the recursive function for Fibonacci: ``` def fibonacci():     # TODO: Base cases and recursive call     pass ```  To complete the recursive function for calculating Fibonacci numbers, we need to define the base cases and the recursive case. The Fibonacci sequence is defined such that: - Fibonacci(0) = 0 - Fibonacci(1) = 1 - For n &gt; 1, Fibonacci(n) = Fibonacci(n-1) + Fibonacci(n-2)  Here's the complete function: ```python def fibonacci():     # Base cases     if n == 0:         return 0     elif n == 1:         return 1     else:         # Recursive call         return fibonacci(n - 1) + fibonacci(n - 2) ```  ### Explanation: - If n = 0, we return 0. - If n = 1, we return 1. - For any other positive integer n, we recursively call the function for n-1 and n-2 and return their sum.  This function will correctly compute the Fibonacci number for any non-negative integer n. However, keep in mind that this recursive implementation can be inefficient for larger values of n due to repeated calculations. For large n, consider using memoization or an iterative approach to improve performance.</pre> |                                        |

Both models end up producing the same output function, but GPT-4o mini also produces a longer explanation.

## 14.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14                                            | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14                                     |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Few-shot                                      | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Few-shot                               |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Recursive Function Completion (Python)        | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Recursive Function Completion (Python) |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Codestral 25.01 Transcript                    | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | OpenAI GPT-4o mini                     |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P-.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temperature: .7 Token Limit:<br>1024 Top-P-.9 | Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Chat Data                              |
| <pre>Example 1 Prompt: Complete the recursive function for factorial: ``` def factorial():     # TODO: Base case and recursive call     pass ```  Answer: def factorial():     # Base case: 0! = 1     if n == 0:         return 1     # Recursive case: n! = n * (n-1)!     return n * factorial(n - 1)  Example 2 Prompt: Complete the recursive function to sum a list of numbers: ``` def sum_list(lst):     # TODO: Base case and recursive call     pass ```  Answer: def sum_list(lst):     # Base case: empty list sums to 0     if not lst:         return 0     # Recursive case: first element + sum of the rest     return lst[0] + sum_list(lst[1:])  Example 3 Prompt: Complete the recursive function to compute x to the power n: ``` def power(x, n):     # TODO: Base case and recursive call ```  </pre> |                                               | <pre>Example 1 Prompt: Complete the recursive function for factorial: ``` def factorial():     # TODO: Base case and recursive call     pass ```  Answer: def factorial():     # Base case: 0! = 1     if n == 0:         return 1     # Recursive case: n! = n * (n-1)!     return n * factorial(n - 1)  Example 2 Prompt: Complete the recursive function to sum a list of numbers: ``` def sum_list(lst):     # TODO: Base case and recursive call     pass ```  Answer: def sum_list(lst):     # Base case: empty list sums to 0     if not lst:         return 0     # Recursive case: first element + sum of the rest     return lst[0] + sum_list(lst[1:])  Example 3 Prompt: Complete the recursive function to compute x to the power n: ``` def power(x, n):     # TODO: Base case and recursive call ```  </pre> |                                        |

... (Skip a few examples in between)...

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chat Data | Based on the examples complete the recursive function for Fibonacci: ``` def fibonacci():     # TODO: Base cases and recursive call     pass ``` }. { "timestamp": "2025-04-28T09:33:43.811Z", "role": "assistant", "message": "Sure, let's complete the recursive function for the Fibonacci sequence. The Fibonacci sequence is defined as follows: - F(0) = 0 - F(1) = 1 - F(n) = F(n-1) + F(n-2) for n > 1  Here is the completed recursive function: ```python def fibonacci(n):     # Base case: F(0) = 0     if n == 0:         return 0     # Base case: F(1) = 1     elif n == 1:         return 1     # Recursive case: F(n) = F(n-1) + F(n-2)     else:         return fibonacci(n - 1) + fibonacci(n - 2) ```  This function handles the base cases for F(0) and F(1), and uses the recursive case to compute F(n) for n > 1."} |
| Chat Data | Based on the examples complete the recursive function for Fibonacci: ``` def fibonacci():     # TODO: Base cases and recursive call     pass ``` }. { "timestamp": "2025-04-28T09:33:53.499Z", "role": "assistant", "message": "Here's how you can complete the recursive function for calculating Fibonacci numbers: ```python def fibonacci(n):     # Base cases: fibonacci(0) = 0, fibonacci(1) = 1     if n == 0:         return 0     if n == 1:         return 1     # Recursive case: fibonacci(n) = fibonacci(n-1) + fibonacci(n-2)     return fibonacci(n - 1) + fibonacci(n - 2) ```  This function defines the Fibonacci sequence, where each number is the sum of the two preceding ones, starting from 0 and 1."}                                                                                                              |

Both models produce code that do the same thing here

## 15.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Number                                      | 15                                          |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Type                                        | Zero-Shot                                   |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Constructor Completion (Python)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Goal                                        | Constructor Completion (Python)             |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Model                                       | OpenAI GPT-4o mini                          |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Temperature: .7 Token Limit: 1024 Top-P: .9 | Temperature: .7 Token Limit: 1024 Top-P: .9 |
| <pre>Complete the class constructor: ``` class Person:     def __init__(self):         # TODO: Add name , age , and optional email         pass ```  To complete the class constructor for the 'Person' class, you need to add parameters for 'name' , 'age' , and an optional 'email'. Here is how you can do it:  ```python class Person:     def __init__(self, name, age, email=None):         self.name = name         self.age = age         self.email = email ```  In this constructor: - 'name' is a required parameter, - 'age' is a required parameter - 'email' is an optional parameter with a default value of 'None'.  Here is how you can create instances of the 'Person' class:  ```python # Creating a Person with name and age person1 = Person("Alice", 30) print(person1.name) # Output: Alice print(person1.age) # Output: 30 print(person1.email) # Output: None  # Create a person with name, age, and email person2 = Person("Bob", 25, "bob@example.com") print(person2.name) # Output: Bob print(person2.age) # Output: 25 print(person2.email) # Output: bob@example.com ``` </pre> | <pre>Complete the class constructor: ``` class Person:     def __init__(self):         # TODO: Add name , age , and optional email         pass ```  To complete the class constructor for the 'Person' class, you need to add parameters for 'name' , 'age' , and an optional 'email'. You can set default values for the 'email' parameter to make it optional. Here's how you can do it:  ```python class Person:     def __init__(self, name, age, email=None):         self.name = name         self.age = age         self.email = email ```  In this implementation: - 'name' and 'age' are required parameters, so they have to be provided when creating an instance of 'Person'. - 'email' is an optional parameter with a default value of 'None', meaning it can be omitted when creating an instance if the email is not available.  Here's an example of how you can create instances of the 'Person' class:  ```python # Creating a person with name, age, and email person1 = Person("Alice", 30, "alice@example.com")  # Creating a person with name and age, without email person2 = Person("Bob", 25)  print(person1.name, person1.age, person1.email) # Output: Alice 30 alice@example.com print(person2.name, person2.age, person2.email) # Output: Bob 25 None ``` </pre> | <pre>Chat Data</pre>                        | <pre>Chat Data</pre>                        |

Both models produce the same output for the constructor, which make sense since there isn't any scope for creativity while doing the task.

## 15.2

|                                                                                                                           |                                                                                                                           |                                             |                                             |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| Number                                                                                                                    | 15                                                                                                                        | Number                                      | 15                                          |
| Type                                                                                                                      | Few-shot                                                                                                                  | Type                                        | Few-shot                                    |
| Goal                                                                                                                      | Constructor Completion (Python)                                                                                           | Goal                                        | Constructor Completion (Python)             |
| Model                                                                                                                     | Codestral 25.01 Transcript                                                                                                | Model                                       | OpenAI GPT-4o mini                          |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                               | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                               | Temperature: .7 Token Limit: 1024 Top-P: .9 | Temperature: .7 Token Limit: 1024 Top-P: .9 |
| <pre>Example 1 Prompt: Complete the class constructor for Student: ``` class Student:     def __init__(self): ```  </pre> | <pre>Example 1 Prompt: Complete the class constructor for Student: ``` class Student:     def __init__(self): ```  </pre> | <pre>Chat Data</pre>                        | <pre>Chat Data</pre>                        |

## Skip...

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Using those examples complete the class constructor:\\ ``` class Person:\\ def __init__(self):\\ # TODO: Add name , age , and optional email\\ pass\\ ``` \\ ), { "timestamp": "2025-04-28T09:34:27.296Z", "role": "assistant", "message": "To complete the class constructor for the 'Person' class, you can follow the pattern used in the previous examples. The constructor should initialize the 'name' , 'age' , and optionally the 'email' attributes. Here is the completed constructor:\\ ``` class Person:\\ def __init__(self, name, age, email=None):\\ self.name = name\\ self.age = age\\ self.email = email ``` In this constructor: - 'name' and 'age' are required parameters. - 'email' is an optional parameter with a default value of 'None'. } ``` | <pre>self.name = name self.salary = salary self.department = department using those examples complete the class constructor:\\ ``` class Person:\\ def __init__(self):\\ # TODO: Add name , age , and optional email\\ pass\\ ``` \\ ), { "timestamp": "2025-04-28T09:34:31.491Z", "role": "assistant", "message": "``` class Person:\\ def __init__(self, name, age, email=None):\\ self.name = name\\ self.age = age\\ self.email = email ``` } ``` </pre> |
| <pre>Chat Data</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <pre>Chat Data</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Both codes produce the same constructor as well here.

## 16.1

| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type      | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Model                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Zero-Shot | Binary Search Completion (Java)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Codestar 25.01 Transcript                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                                                                                                    |
| <pre>Complete the binary search implementation: """ public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {      int mid = (left + right) / 2;     // TODO: Compare and adjust bounds  } return -1; } """  To complete the binary search implementation, you need to compare the target value with the middle element of the array and adjust the bounds ('left' and 'right') accordingly. Here is the completed implementation:  ```java public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1;  while (left &lt;= right) {     int mid = (left + right) / 2;      // Check if the middle element is the target     if (arr[mid] == target) {         return mid; // Target found, return the index     }      // If the target is less than the middle element, search in the left half     if (target &lt; arr[mid]) {         right = mid - 1;     }     // If the target is greater than the middle element, search in the right half     else {         left = mid + 1;     } }  return -1; // Target not found }  #### Explanation: 1. **Initialization**: 'left' is set to the start of the array (0), and 'right' is set to the end of the array (arr.length - 1). 2. **Loop Condition**: The loop continues as long as 'left' is less than or equal to 'right'. 3. **Middle Element Calculation**: 'mid' is calculated as the average of 'left' and 'right'. 4. **Comparison**: - If 'arr[mid]' equals the 'target', the function returns 'mid' (the index of the target). - If the 'target' is less than 'arr[mid]', it means the target could be in the left half, so 'right' is updated to 'mid - 1'. - If the 'target' is greater than 'arr[mid]', it means the target could be in the right half, so 'left' is updated to 'mid + 1'. 5. **Target Not Found**: If the loop exits without finding the target, the function returns '-1'.</pre> |           | <pre>Complete the binary search implementation: """ public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {      int mid = (left + right) / 2;     // TODO: Compare and adjust bounds  } return -1; } """  To complete the binary search implementation, you need to compare the middle element ('arr[mid]') with the target value. Depending on the result of this comparison, you will adjust the 'left' or 'right' bounds accordingly. Here's the completed code:  ```java public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {     int mid = (left + right) / 2;      if (arr[mid] == target) {         return mid; // Target found at index mid     } else if (arr[mid] &lt; target) {         left = mid + 1; // Target is in the right half     } else {         right = mid - 1; // Target is in the left half     } }  return -1; // Target not found }  #### Explanation: 1. **Initialization**: We start with two pointers, 'left' and 'right', which represent the bounds of the search space. 2. **Loop**: We continue the loop as long as 'left' is less than or equal to 'right'. 3. **Mid Calculation**: We calculate the middle index 'mid'. 4. **Comparison**: - If 'arr[mid]' is equal to 'target', we return 'mid', indicating that the target has been found. - If 'arr[mid]' is less than 'target', it means the target must be in the right half, so we adjust 'left' to 'mid + 1'. - If 'arr[mid]' is greater than 'target', it means the target must be in the left half, so we adjust 'right' to 'mid - 1'. 5. **Return**: If we exit the loop without finding the target, we return -1 to indicate that the target is not in the array.</pre> |                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Chat Data                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <pre>This implementation assumes that the input array 'arr' is sorted in ascending order. If the array is not sorted, the binary search algorithm will not work correctly.</pre> |

Both models produce extremely similar output, but just the conditions are the opposite of each other.

## 16.2

| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Type             | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Model                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Self-Consistency | Binary Search Completion (Java)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Codestar 25.01 Transcript                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Temperature: .7 Token Limit:<br>1024 Top-P .9                                                             |
| <pre>Complete the binary search implementation: """ public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {      int mid = (left + right) / 2;     // TODO: Compare and adjust bounds  } return -1; } """  To complete the binary search implementation, you need to compare the middle element of the array with the target and adjust the bounds ('left' and 'right') accordingly. Here is the completed implementation:  ```java public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {      int mid = (left + right) / 2;      // Check if target is present at mid     if (arr[mid] == target) {         return mid;     }      // If target is greater, ignore the left half     if (arr[mid] &lt; target) {         left = mid + 1;     }     // If target is smaller, ignore the right half     else {         right = mid - 1;     } }  // Target is not present in the array return -1; }  #### Explanation: 1. **Initialization**: 'left' is set to 0 and 'right' is set to the last index of the array. 2. **Loop**: The loop continues as long as 'left' is less than or equal to 'right'. 3. **Mid Calculation**: Calculate the middle index 'mid' using 'left + (right - left) / 2' to avoid potential overflow issues. 4. **Comparison**: - If 'arr[mid]' is equal to 'target', return 'mid' because the target is found. - If 'arr[mid]' is less than 'target', adjust 'left' to 'mid + 1' to ignore the left half of the array. - If 'arr[mid]' is greater than 'target', adjust 'right' to 'mid - 1' to ignore the right half of the array. 5. **Not Found**: If the loop completes without finding the target, return -1.</pre> |                  | <pre>Complete the binary search implementation: """ public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {      int mid = (left + right) / 2;     // TODO: Compare and adjust bounds  } return -1; } """  Sure below is the completed implementation of the binary search algorithm. The code checks whether the value at the midpoint is equal to the target value, and accordingly adjusts the search bounds.  ```java public int binarySearch(int[] arr , int target) { int left = 0, right = arr.length - 1; while (left &lt;= right) {     int mid = (left + right) / 2;      // Compare the middle element with the target     if (arr[mid] == target) {         return mid; // Target found, return the index     } else if (arr[mid] &lt; target) {         left = mid + 1; // Target is in the right half     } else {         right = mid - 1; // Target is in the left half     } }  return -1; // Target not found }  #### Explanation: 1. **Initialization**: We start by initializing two pointers, 'left' and 'right', which represent the current search range. 2. **Loop**: The 'while' loop runs as long as 'left' is less than or equal to 'right'. 3. **Calculate Midpoint**: The midpoint 'mid' is calculated as the average of 'left' and 'right'. 4. **Comparison**: - If the element at 'mid' is equal to 'target', the index 'mid' is returned. - If the element at 'mid' is less than 'target', the target must be in the right half of the array, so we adjust 'left' to 'mid + 1'. - If the element at 'mid' is greater than 'target', the target must be in the left half, so we adjust 'right' to 'mid - 1'. 5. **Return**: If the loop finishes without finding the target, -1 is returned, indicating that the target is not in the array.</pre> |                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Chat Data                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <pre>This implementation ensures that the binary search algorithm runs in O(log n) time complexity.</pre> |

Both models in this case have extremely similar output.

## 17.1

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|------|-----------|------|-----------------------------------|-------|----------------------------|---------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|------|-----------|------|-----------------------------------|-------|--------------------|---------------------------------------------|--|
| A                                           | <table border="1"> <tr><td>Number</td><td>17</td></tr> <tr><td>Type</td><td>Zero-Shot</td></tr> <tr><td>Goal</td><td>Self-Consistency Bug Fixing (C++)</td></tr> <tr><td>Model</td><td>Codestral 25.01 Transcript</td></tr> <tr><td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> Resolve inconsistency between function name and logic: ``` // Supposed to return true if x is even bool isOdd(int x) {     return x % 2 == 0; // Logic contradicts function name } ```  The inconsistency between the function name "isOdd" and its logic, which checks if 'x' is even, can be resolved by updating either the function name or the logic. Here, I'll provide both solutions:  ### Option 1: Update the Function Logic If the intention is to check if 'x' is odd, you should update the logic accordingly:  ```cpp // Checks if x is odd bool isOdd(int x) {     return x % 2 != 0; } ```  ### Option 2: Update the Function Name If the intention is to check if 'x' is even, you should rename the function to reflect this:  ```cpp // Checks if x is even bool isEven(int x) {     return x % 2 == 0; } ```  ### Full Corrected Code Based on the context that you want the function to return "true" if 'x' is even, here is the corrected code:  ```cpp // Checks if x is even bool isEven(int x) {     return x % 2 == 0; } ``` </pre> <p>Chat Data</p> | Number | 17 | Type | Zero-Shot | Goal | Self-Consistency Bug Fixing (C++) | Model | Codestral 25.01 Transcript | Temperature: .7 Token Limit: 1024 Top-P: .9 |  | <table border="1"> <tr><td>Number</td><td>17</td></tr> <tr><td>Type</td><td>Zero-Shot</td></tr> <tr><td>Goal</td><td>Self-Consistency Bug Fixing (C++)</td></tr> <tr><td>Model</td><td>OpenAI GPT-4o mini</td></tr> <tr><td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> Resolve inconsistency between function name and logic: ``` // Supposed to return true if x is even bool isOdd(int x) {     return x % 2 == 0; // Logic contradicts function name } ```  The function name "isOdd" suggests that it should return "true" if the integer 'x' is odd. However, the logic inside the function currently returns "true" if 'x' is even (<math>x \% 2 == 0</math>).  To resolve this inconsistency, you have two options: 1. **Rename the Function:** Change the function name to "isEven" to match its logic. 2. **Change the Logic:** Keep the function name "isOdd" and modify the logic to correctly reflect that it checks for odd numbers.  Here are both options implemented: ### Option 1: Rename the Function  ```cpp // Supposed to return true if x is even bool isEven(int x) {     return x % 2 == 0; // Now the logic matches the function name } ```  ### Option 2: Change the Logic  ```cpp // Supposed to return true if x is odd bool isOdd(int x) {     return x % 2 != 0; // Now the logic matches the function name } ```  Choose one of these options based on the intended functionality of your code. If you need to check for evenness, go with the first option. If you want to check for oddness, go with the second option. </pre> <p>Chat Data</p> | Number | 17 | Type | Zero-Shot | Goal | Self-Consistency Bug Fixing (C++) | Model | OpenAI GPT-4o mini | Temperature: .7 Token Limit: 1024 Top-P: .9 |  |
| Number                                      | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Type                                        | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Goal                                        | Self-Consistency Bug Fixing (C++)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Model                                       | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Temperature: .7 Token Limit: 1024 Top-P: .9 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Number                                      | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Type                                        | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Goal                                        | Self-Consistency Bug Fixing (C++)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Model                                       | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |
| Temperature: .7 Token Limit: 1024 Top-P: .9 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |    |      |           |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |    |      |           |      |                                   |       |                    |                                             |  |

Both models use similar trains of thought and identify the two ways to fix the inconsistency in this case.

## 17.2

| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | B                                 | C  | D    |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----|------|-----------------|------|-----------------------------------|-------|----------------------------|---------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|------|-----------------|------|-----------------------------------|-------|--------------------|---------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|------|-----------------|------|-----------------------------------|-------|--------------------|---------------------------------------------|--|
| <table border="1"> <tr><td>Number</td><td>17</td></tr> <tr><td>Type</td><td>Prompt-Chaining</td></tr> <tr><td>Goal</td><td>Self-Consistency Bug Fixing (C++)</td></tr> <tr><td>Model</td><td>Codestral 25.01 Transcript</td></tr> <tr><td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> [{"timestamp": "2025-04-28T09:55:44.418Z", "role": "user", "message": "I have a function I need you to look at"}, {"timestamp": "2025-04-28T09:55:45.172Z", "role": "assistant", "message": "Of course! I'd be happy to help you with your function. Please go ahead and share the code you need assistance with, and let me know what specific issues or questions you have."}, {"timestamp": "2025-04-28T09:55:46.761Z", "role": "user", "message": "/Supposed to return true if x is even\nbool isOdd(int x) {\n    return x % 2 == 0; // Logic contradicts function name\n}"}, {"timestamp": "2025-04-28T09:55:49.121Z", "role": "assistant", "message": "It looks like there is a mistake in your function. The function is named 'isOdd', but the logic inside the function checks if 'x' is even. To fix this, you should change the logic to check if 'x' is odd instead.\n\nHere is the corrected function:\n\n```cpp\nbool isOdd(int x) {\n    return x % 2 != 0; // Logic contradicts function name\n}\n```\n\nIn this corrected version, the function returns 'true' if 'x' is odd (i.e., <math>x \% 2</math> is not equal to '0'), and 'false' otherwise.\n\nIf you want to have a function that returns 'true' if 'x' is even, you should name it appropriately, for example:\n\n```cpp\nbool isEven(int x) {\n    return x % 2 == 0;\n}\n```\n\nThis way, the function name and the logic inside the function will be consistent." </pre> <p>Chat Data</p> | Number                            | 17 | Type | Prompt-Chaining | Goal | Self-Consistency Bug Fixing (C++) | Model | Codestral 25.01 Transcript | Temperature: .7 Token Limit: 1024 Top-P: .9 |  | <table border="1"> <tr><td>Number</td><td>17</td></tr> <tr><td>Type</td><td>Prompt-Chaining</td></tr> <tr><td>Goal</td><td>Self-Consistency Bug Fixing (C++)</td></tr> <tr><td>Model</td><td>OpenAI GPT-4o mini</td></tr> <tr><td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> [{"timestamp": "2025-04-28T09:55:59.516Z", "role": "user", "message": "I have a function I need you to look at"}, {"timestamp": "2025-04-28T09:56:00.507Z", "role": "assistant", "message": "Of course! Please provide the function you'd like me to review, and let me know what specific aspects you're interested in, such as its correctness, optimization, or any other particular concerns."}, {"timestamp": "2025-04-28T09:56:18.130Z", "role": "user", "message": "/Supposed to return true if x is even\nbool isOdd(int x) {\n    return x % 2 == 0; // Logic contradicts function name\n}"}, {"timestamp": "2025-04-28T09:56:22.910Z", "role": "assistant", "message": "It looks like there's a logic contradiction in the function you've provided. The function is named 'isOdd', which suggests that it should return 'true' if the number is odd. However, the implementation returns 'true' if 'x' is even. Here's a corrected version of the function based on what the name suggests it should do:\n\n```cpp\n// Returns true if x is odd\nbool isOdd(int x) {\n    return x % 2 != 0; // True if x is not divisible by 2\n}\n```\n\nIn this corrected version:\n- The function returns 'true' if 'x' is **odd** (i.e., if '<math>x \bmod 2</math> is not equal to 0)'. </pre> <p>Chat Data</p> | Number | 17 | Type | Prompt-Chaining | Goal | Self-Consistency Bug Fixing (C++) | Model | OpenAI GPT-4o mini | Temperature: .7 Token Limit: 1024 Top-P: .9 |  | <table border="1"> <tr><td>Number</td><td>17</td></tr> <tr><td>Type</td><td>Prompt-Chaining</td></tr> <tr><td>Goal</td><td>Self-Consistency Bug Fixing (C++)</td></tr> <tr><td>Model</td><td>OpenAI GPT-4o mini</td></tr> <tr><td>Temperature: .7 Token Limit: 1024 Top-P: .9</td><td></td></tr> </table> <pre> [{"timestamp": "2025-04-28T09:55:59.516Z", "role": "user", "message": "I have a function I need you to look at"}, {"timestamp": "2025-04-28T09:56:00.507Z", "role": "assistant", "message": "Of course! Please provide the function you'd like me to review, and let me know what specific aspects you're interested in, such as its correctness, optimization, or any other particular concerns."}, {"timestamp": "2025-04-28T09:56:18.130Z", "role": "user", "message": "/Supposed to return true if x is even\nbool isOdd(int x) {\n    return x % 2 == 0; // Logic contradicts function name\n}"}, {"timestamp": "2025-04-28T09:56:22.910Z", "role": "assistant", "message": "It looks like there's a logic contradiction in the function you've provided. The function is named 'isOdd', which suggests that it should return 'true' if the number is odd. However, the implementation returns 'true' if 'x' is even. Here's a corrected version of the function based on what the name suggests it should do:\n\n```cpp\n// Returns true if x is odd\nbool isOdd(int x) {\n    return x % 2 != 0; // True if x is not divisible by 2\n}\n```\n\nIn this corrected version:\n- The function returns 'true' if 'x' is **odd** (i.e., if '<math>x \bmod 2</math> is not equal to 0)'. </pre> <p>Chat Data</p> | Number | 17 | Type | Prompt-Chaining | Goal | Self-Consistency Bug Fixing (C++) | Model | OpenAI GPT-4o mini | Temperature: .7 Token Limit: 1024 Top-P: .9 |  |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17                                |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Prompt-Chaining                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Self-Consistency Bug Fixing (C++) |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestral 25.01 Transcript        |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17                                |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Prompt-Chaining                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Self-Consistency Bug Fixing (C++) |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-4o mini                |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17                                |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Prompt-Chaining                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Self-Consistency Bug Fixing (C++) |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-4o mini                |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |    |      |                 |      |                                   |       |                            |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |    |      |                 |      |                                   |       |                    |                                             |  |

Both models use similar trains of thought and identify the two ways to fix the inconsistency in this case as well.

## 18.1

| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | C                                                                              | D                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9 | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9 |
| Identify and fix the bug in my JavaScript code:<br>```function isEven(n) {<br>return n % 2; // Returns 1 or 0, not true/false<br>}<br><br>The bug in your JavaScript code is that the 'isEven' function returns '1' for odd numbers and '0' for even numbers, rather than 'true' or 'false'. To fix this, you should explicitly return 'true' or 'false' based on whether the number is even or odd.<br><br>Here is the corrected code:<br>```javascript<br>function isEven(n) {<br>return n % 2 === 0; // Returns true if n is even, false otherwise<br>}<br><br>In this corrected version, the function checks if 'n % 2' is equal to '0' (which means 'n' is even) and returns 'true' if it is, and 'false' otherwise. | Identify and fix the bug in my JavaScript code:<br>```function isEven(n) {<br>return n % 2; // Returns 1 or 0, not true/false<br>}<br><br>The bug in your JavaScript code is that the 'isEven' function currently returns the result of the expression 'n % 2', which yields '0' for even numbers and '1' for odd numbers. However, you want the function to return 'true' for even numbers and 'false' for odd numbers.<br><br>To fix this, you should return the result of the comparison 'n % 2 === 0', which will evaluate to 'true' for even numbers and 'false' for odd numbers. Here's the corrected code:<br>```javascript<br>function isEven(n) {<br>return n % 2 === 0; // Returns true for even numbers, false for odd numbers<br>}<br><br>Now, when you call 'isEven(n)' with an even number, it will return 'true', and with an odd number, it will return 'false'. | Chat Data                                                                      | Chat Data                                                                      |
| Both models return the same fix to the code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                |                                                                                |

Both models return the same fix to the code.

## 18.2

| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | C                                                                              | D                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9 | Number<br>Type<br>Goal<br>Model<br>Temperature: .7 Token Limit: 1024 Top-P: .9 |
| Identify and fix the bug in my JavaScript code:<br>```<br>{<br>"timestamp": "2025-04-28T10:03:44.591Z",<br>"role": "user",<br>"message": "I have a javascript function I need you to look at."<br>},<br>{<br>"timestamp": "2025-04-28T10:03:45.381Z",<br>"role": "assistant",<br>"message": "Of course! Feel free to paste your JavaScript function here, and I'll be happy to help you with it. Whether you need assistance with debugging, optimizing, understanding, or any other aspect, just let me know!"<br>},<br>{<br>"timestamp": "2025-04-28T10:03:49.267Z",<br>"role": "user",<br>"message": "function isEven(n) {<br>return n % 2;<br>}"<br>},<br>{<br>"timestamp": "2025-04-28T10:03:52.261Z",<br>"role": "assistant",<br>"message": "Your 'isEven' function is almost correct, but it currently returns '0' for even numbers and '1' for odd numbers. Typically, a function that checks if a number is even should return a boolean value ('true' or 'false')."<br><br>Here's how you can modify the function to return a boolean:<br>```javascript<br>function isEven(n) {<br>return n % 2 === 0;<br>}<br><br>This way, the function will return 'true' if 'n' is even and 'false' if 'n' is odd.<br>### Example Usage: | Identify and fix the bug in my JavaScript code:<br>```<br>{<br>"timestamp": "2025-04-28T10:05:55.388Z",<br>"role": "user",<br>"message": "I have a javascript function I need you to look at."<br>},<br>{<br>"timestamp": "2025-04-28T10:05:56.051Z",<br>"role": "assistant",<br>"message": "Please provide the JavaScript function you'd like me to look at, and let me know what specific feedback or help you need with it."<br>},<br>{<br>"timestamp": "2025-04-28T10:06:43.851Z",<br>"role": "user",<br>"message": "function isEven(n) {\n        return n % 2;<br>}"<br>},<br>{<br>"timestamp": "2025-04-28T10:06:47.367Z",<br>"role": "assistant",<br>"message": "It looks like you have a simple JavaScript function that is intended to determine if a number is even. However, there is a small issue with the implementation. Your function currently returns the remainder of 'n' divided by '2', which will result in '0' for even numbers and '1' for odd numbers. To correctly determine if a number is even, you should return a boolean value.<br><br>Here's an improved version of your function:<br>```javascript<br>function isEven(n) {<br>return n % 2 === 0;<br>}<br>### Explanation: | Chat Data                                                                      |                                                                                |
| Both models return the same fix to the code in this case as well as generating examples.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 19.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                |                                                                                |

Both models return the same fix to the code in this case as well as generating examples.

## 19.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19                                          |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Zero-Shot                                   |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summary Decomposition (C++)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summary Decomposition (C++)                 |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestr 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-4o mini                          |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Temperature: .7 Token Limit: 1024 Top-P: .9 |
| <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the C++ code into logical steps:      #### High-Level Comment:     "Function that validates an input , calculates square , and returns result"      #### Logical Steps:     1. **Validate Input**:         - Check if the input 'x' is less than 0.         - If 'x' is less than 0, return -1 (indicating an invalid input).     2. **Calculate Square**:         - If the input 'x' is 0 or positive, calculate the square of 'x' (i.e., 'x * x').     3. **Return Result**:         - Return the calculated square.      #### Code Breakdown:     ===cpp     int process(int x) {         if (x &lt; 0) return -1;         return x * x;     }     ===   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the C++ code into logical steps:      #### High-Level Comment:     "Function that validates an input , calculates square , and returns result"      #### Logical Steps:     1. **Validate Input**:         - Check if the input 'x' is less than 0.         - If 'x' is less than 0, return -1 (indicating an invalid input).     2. **Calculate Square**:         - If the input 'x' is 0 or positive, calculate the square of 'x' (i.e., 'x * x').     3. **Return Result**:         - Return the calculated square.      #### Code Breakdown:     ===cpp     int process(int x) {         if (x &lt; 0) return -1;         return x * x;     }     ===   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      To decompose the high-level comment/summary of the C++ code into logical steps, we can break down the process as follows:     1. **Define a Function**: The code defines a function named 'process' that takes an integer parameter 'x'.     2. **Input Validation**:         - The function checks if the input 'x' is less than 0.         - If 'x' is negative, the function returns -1 to indicate an invalid input.     3. **Calculate Square**:         - If the input 'x' is valid (i.e., non-negative), the function proceeds to calculate the square of 'x' by multiplying 'x' by itself ('x * x').     4. **Return Result**:         - The function returns the calculated square value.     5. **Overall Function Behavior**:         - If the input is negative, the function returns -1; otherwise, it returns the square of the input.      By organizing the steps this way, we clearly outline the purpose and behavior of the 'process' function in the provided C++ code.   </pre> |                                             |
| Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | This decomposition helps in understanding each part of the function clearly and ensuring that each step is logically sound.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19                                          |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Self-Consistency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Self-Consistency                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summary Decomposition (C++)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summary Decomposition (C++)                 |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestr 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | OpenAI GPT-4o mini                          |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Temperature: .7 Token Limit: 1024 Top-P: .9 |
| <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the corresponding C++ code into logical steps:      #### High-Level Comment:     1. **Input Validation**: The function checks if the input is valid.     2. **Calculation**: If the input is valid, it calculates the square of the input.     3. **Result Return**: It returns the result of the calculation.      #### C++ Code Steps:     1. **Function Declaration**:         - ````cpp         int process(int x)         ...       ````          - This declares a function named 'process' that takes an integer 'x' as an argument and returns an integer.      2. **Input Validation**:         - ````cpp         if (x &lt; 0) return -1;         ...       ````          - This checks if the input 'x' is less than 0.         - If 'x' is less than 0, the function immediately returns -1, indicating an invalid input.      3. **Calculation**:         - ````cpp         return x * x;       ````          - The function returns the calculated square of 'x'.     </pre> <p>If the input 'x' is not less than 0 (i.e., it is valid), the function calculates the square of 'x' by multiplying 'x' by itself.</p> | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the corresponding C++ code into logical steps:      #### High-Level Comment:     1. **Input Validation**: The function checks if the input is valid.     2. **Calculation**: If the input is valid, it calculates the square of the input.     3. **Result Return**: It returns the result of the calculation.      #### C++ Code Steps:     1. **Function Declaration**:         - ````cpp         int process(int x)         ...       ````          - This declares a function named 'process' that takes an integer 'x' as an argument and returns an integer.      2. **Input Validation**:         - ````cpp         if (x &lt; 0) return -1;         ...       ````          - This checks if the input 'x' is less than 0.         - If 'x' is less than 0, the function immediately returns -1, indicating an invalid input.      3. **Calculation**:         - ````cpp         return x * x;       ````          - The function returns the calculated square of 'x'.     </pre> <p>To decompose the high-level comment/summary of the provided C++ code into logical steps, we can break it down as follows:</p> | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      To decompose the high-level comment/summary of the provided C++ code into logical steps, we can break it down as follows:     1. **Function Definition**:         - The function 'process' is defined, which takes a single integer parameter 'x'.     2. **Input Validation**:         - The function checks if the input value 'x' is less than 0.         - If 'x' is negative, the function returns -1 to indicate that the input is invalid.     3. **Square Calculation**:         - If the input value 'x' is valid (i.e., non-negative), the function calculates the square of 'x' by multiplying 'x' by itself ('x * x').     4. **Return Result**:         - The function returns the square of 'x' as the output, which is the result of the calculation.      In summary, the function processes an integer input by validating it, calculating its square if valid, and returning the appropriate result.   </pre>                                                                      |                                             |
| Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | This decomposition clearly outlines the purpose and operation of the 'process' function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |

## 19.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 19                                          |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Self-Consistency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Self-Consistency                            |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Summary Decomposition (C++)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Summary Decomposition (C++)                 |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Codestr 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | OpenAI GPT-4o mini                          |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Temperature: .7 Token Limit: 1024 Top-P: .9 |
| <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the corresponding C++ code into logical steps:      #### High-Level Comment:     1. **Input Validation**: The function checks if the input is valid.     2. **Calculation**: If the input is valid, it calculates the square of the input.     3. **Result Return**: It returns the result of the calculation.      #### C++ Code Steps:     1. **Function Declaration**:         - ````cpp         int process(int x)         ...       ````          - This declares a function named 'process' that takes an integer 'x' as an argument and returns an integer.      2. **Input Validation**:         - ````cpp         if (x &lt; 0) return -1;         ...       ````          - This checks if the input 'x' is less than 0.         - If 'x' is less than 0, the function immediately returns -1, indicating an invalid input.      3. **Calculation**:         - ````cpp         return x * x;       ````          - The function returns the calculated square of 'x'.     </pre> <p>- If the input 'x' is not less than 0 (i.e., it is valid), the function calculates the square of 'x' by multiplying 'x' by itself.</p> | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      Sure, let's break down the high-level comment and the corresponding C++ code into logical steps:      #### High-Level Comment:     1. **Input Validation**: The function checks if the input is valid.     2. **Calculation**: If the input is valid, it calculates the square of the input.     3. **Result Return**: It returns the result of the calculation.      #### C++ Code Steps:     1. **Function Declaration**:         - ````cpp         int process(int x)         ...       ````          - This declares a function named 'process' that takes an integer 'x' as an argument and returns an integer.      2. **Input Validation**:         - ````cpp         if (x &lt; 0) return -1;         ...       ````          - This checks if the input 'x' is less than 0.         - If 'x' is less than 0, the function immediately returns -1, indicating an invalid input.      3. **Calculation**:         - ````cpp         return x * x;       ````          - The function returns the calculated square of 'x'.     </pre> <p>- If the input 'x' is not less than 0 (i.e., it is valid), the function calculates the square of 'x' by multiplying 'x' by itself.</p> | <pre>         Decompose the high-level comment/summary of the c++ code into logical steps:         ==         // Function that validates an input , calculates square , and returns result         int process(int x) {             if (x &lt; 0) return -1;             return x * x;         }     ==      To decompose the high-level comment/summary of the provided C++ code into logical steps, we can break it down as follows:     1. **Function Definition**:         - The function 'process' is defined, which takes a single integer parameter 'x'.     2. **Input Validation**:         - The function checks if the input value 'x' is less than 0.         - If 'x' is negative, the function returns -1 to indicate that the input is invalid.     3. **Square Calculation**:         - If the input value 'x' is valid (i.e., non-negative), the function calculates the square of 'x' by multiplying 'x' by itself ('x * x').     4. **Return Result**:         - The function returns the square of 'x' as the output, which is the result of the calculation.      In summary, the function processes an integer input by validating it, calculating its square if valid, and returning the appropriate result.   </pre> |                                             |
| Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | This decomposition clearly outlines the purpose and operation of the 'process' function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |

Both models decompose the function, but codestr seems to break it down further and give a longer explanation

## 20.1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                      |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Number                                                                                               | 20                 |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type                                                                                                 | Zero-Shot          |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Goal                                                                                                 |                    |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Model                                                                                                | OpenAI GPT-4o mini |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Temperature: .7 Token Limit: 1024 Top-P: .9                                                          |                    |
| <pre>Complete the function based on intent: def calculate_average(scores):     total = 0     # TODO: Complete to return average     pass     ...  To complete the 'calculate_average' function, you need to iterate through the list of scores, sum them up, and then calculate the average. Here's how you can do it:  '''python def calculate_average(scores):     total = 0     # Iterate through the scores and sum them up     for score in scores:         total += score     # Calculate the average     average = total / len(scores)     return average  # Example usage: scores = [85, 90, 92, 88, 95] print(calculate_average(scores)) # Output: 90.0 '''  This function works as follows: 1. Initializes 'total' to 0. 2. Iterates through each score in the 'scores' list and adds it to 'total'. 3. Calculates the average by dividing 'total' by the number of scores (which is 'len(scores)').</pre> | <pre>Complete the function based on intent: def calculate_average(scores):     total = 0     # TODO: Complete to return average     pass     ...  To complete the 'calculate_average' function, we need to calculate the average of the scores provided in the list. The average is calculated by dividing the total sum of the scores by the number of scores.  Here's the completed function:  '''python def calculate_average(scores):     total = sum(scores) # Calculate the sum of the scores     count = len(scores) # Get the number of scores      if count == 0: # Check for division by zero         return 0 # Return 0 or None if there are no scores     average = total / count # Calculate the average     return average # Return the average     ...  '''Explanation: - We use 'sum(scores)' to get the total of all scores in the list. - We use 'len(scores)' to find out how many scores there are. - We check if the count is zero to avoid division by zero, returning 0 in that case. - Finally, we compute the average and return it.</pre> | <pre>This function will now correctly calculate and return the average of the scores provided.</pre> |                    |
| Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Chat Data                                                                                            |                    |

In this case, both models take slightly different quotes but the GPT-4o uses a slightly more cleaner way.

## 20.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                      |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Number                                                                                               | 20                 |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Prompt-Chaining                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Type                                                                                                 | Prompt-Chaining    |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Goal                                                                                                 |                    |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codestral 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Model                                                                                                | OpenAI GPT-4o mini |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Temperature: .7 Token Limit: 1024 Top-P: .9                                                          |                    |
| <pre>[{"timestamp": "2025-04-28T10:14:43.544Z", "role": "user", "message": "I have a method I need you to implement"}, {"timestamp": "2025-04-28T10:14:45.544Z", "role": "assistant", "message": "Sure, I'd be happy to help you implement a method! To provide the most accurate assistance, I'll need a bit more information: 1. **Programming Language**: What programming language are you using? 2. **Method Details**: What should the method do? What are its inputs and outputs? 3. **Specific Requirements**: Are there any specific requirements or constraints for the method? 4. **Example**: Do you have an example of how the method should work?"}, {"timestamp": "2025-04-28T10:15:03.410Z", "role": "user", "message": "I have a list called scores and I need you to calculate the average of the list and return it"}, {"timestamp": "2025-04-28T10:15:06.992Z", "role": "assistant", "message": "Sure! I can help you with that. Let's assume you are using Python for this task. We can write a function that takes a list of scores and returns the average. Here is an example implementation:'''python def calculate_average(scores): if not scores: # Check if the list is empty return 0 # Return 0 if the list is empty to avoid division by zero total = sum(scores) # Calculate the sum of the scores count = len(scores) # Get the number of scores average = total / count # Calculate the average return average''' Example usage: scores = [85, 90, 92, 88] average_score = calculate_average(scores) print("The average score is:", average_score)'''Explanation: 1. **Check for Empty List**: The function first checks if the list is empty. If it is, it returns 0 to avoid division by zero. 2. **Sum and Count**: It calculates the sum of all the scores and the number of scores. 3. **Calculate Average**: It then divides the total sum by the count to get the average. 4. **Return Average**: Finally, it returns the calculated average. You can use this function with any list of scores to get the average. The example usage provided shows how to use the function with a sample list of scores.", {"timestamp": "2025-04-28T10:15:16.763Z", "role": "user", "message": "Can you just give me the method?"}, {"timestamp": "2025-04-28T10:15:18.987Z", "role": "assistant", "message": "Certainly! Here is the method for calculating the average of a list of scores in Python:'''python def calculate_average(scores): if not scores: # Check if the list is empty return 0 # Return 0 if the list is empty to avoid division by zero total = sum(scores) # Calculate the sum of the scores count = len(scores) # Get the number of scores average = total / count # Calculate the average return average''' You can use this method directly in your code. For example:'''python scores = [85, 90, 92, 88] average_score = calculate_average(scores) print("The average score is:", average_score)'''</pre> | <pre>[{"timestamp": "2025-04-28T10:15:42.810Z", "role": "user", "message": "I have a method I need you to implement"}, {"timestamp": "2025-04-28T10:15:43.504Z", "role": "assistant", "message": "Sure! Please provide the details of the method you'd like me to implement, including any specific requirements, programming language, and the functionality you need."}, {"timestamp": "2025-04-28T10:15:51.884Z", "role": "user", "message": "I have a list called scores and I need you to calculate the average of the list and return it"}, {"timestamp": "2025-04-28T10:15:54.548Z", "role": "assistant", "message": "Absolutely! Below is a simple implementation of a method to calculate the average of a list called 'scores'. I'll provide examples in Python, but let me know if you need a different programming language."}, {"timestamp": "2025-04-28T10:16:05.651Z", "role": "user", "message": "Function Definition: The function 'calculate_average' takes a list of scores as input."}, {"timestamp": "2025-04-28T10:16:08.010Z", "role": "assistant", "message": "Check for Empty List: It checks if the list is empty and returns 0 if it is."}, {"timestamp": "2025-04-28T10:16:08.010Z", "role": "user", "message": "Calculate Average: It computes the average by dividing the sum of scores by the number of scores."}, {"timestamp": "2025-04-28T10:16:08.010Z", "role": "assistant", "message": "Return the Average: Finally, it returns the calculated average."}, {"timestamp": "2025-04-28T10:16:08.010Z", "role": "user", "message": "If you have any specific requirements or another language in mind, just let me know!"}, {"timestamp": "2025-04-28T10:16:08.010Z", "role": "assistant", "message": "Certainly! Here is just the method to calculate the average of a list named 'scores' in Python:'''python</pre> | <pre>This function will now correctly calculate and return the average of the scores provided.</pre> |                    |
| Chat Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Chat Data                                                                                            |                    |

|  |                                                                       |           |                                                                                                                                                                                                                                                                                      |
|--|-----------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <pre>... This will output: ... The average score is: 86.0 ... ]</pre> | Chat Data | <pre>def calculate_average(scores):     if not scores: # Check if the list is empty         return 0 # Return 0 for an empty list     return sum(scores) / len(scores)     ...  You can copy and use this method directly in your code. Let me know if you need anything else!</pre> |
|--|-----------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In this case both models produce similar code in the output.

## 21.1

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                      | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Number                      | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Type                        | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type                        | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Goal                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Goal                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Model                       | Codestratal 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Model                       | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Temperature: .7 Token Limit | Codestratal 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Temperature: .7 Token Limit | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Limit: 1024 Top-P: .9       | Codestratal 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Limit: 1024 Top-P: .9       | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                             | Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety." ``` # utils.py - Script to parse and summarize numeric CSV files  import csv  def read_csv(filepath):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             | Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety." ``` # utils.py - Script to parse and summarize numeric CSV files  import csv  def read_csv(filepath):     with open(filepath, 'r') as f:         return [row for row in csv.reader(f)]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                             | Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety." ``` # utils.py - Script to parse and summarize numeric CSV files  import csv  def read_csv(filepath):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             | Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety." ``` # utils.py - Script to parse and summarize numeric CSV files  import csv  def read_csv(filepath):     with open(filepath, 'r') as f:         return [row for row in csv.reader(f)]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                             | The provided utility script has several potential issues and areas for improvement. Here are some key points: <ul style="list-style-type: none"> <li>1. **Indentation Errors**: The script contains indentation errors, which will cause syntax errors when run.</li> <li>2. **Error Handling**: There is no error handling for file operations or CSV parsing, which could lead to crashes if the file is missing or malformed.</li> <li>3. **Magic Number**: The column index `1` is hardcoded, making the script less flexible.</li> <li>4. **Readability**: The script could be more readable with better variable naming and structure.</li> </ul> Here is the refactored version of the script with these issues addressed:       ```python       # utils.py - Script to parse and summarize numeric CSV files        import csv       import os        def read_csv(filepath):           """Reads a CSV file and returns its contents as a list of rows."""           if not os.path.exists(filepath):               raise FileNotFoundError(f"The file {filepath} does not exist.")            with open(filepath, 'r') as f:               return [row for row in csv.reader(f)] |                             | The provided utility script has several potential issues and areas for improvement. Here are some key points: <ul style="list-style-type: none"> <li>1. **Indentation Errors**: The script contains indentation errors, which will cause syntax errors when run.</li> <li>2. **Error Handling**: There is no error handling for file operations or CSV parsing, which could lead to crashes if the file is missing or malformed.</li> <li>3. **Magic Number**: The column index `1` is hardcoded, making the script less flexible.</li> <li>4. **Readability**: The script could be more readable with better variable naming and structure.</li> </ul> Here is the refactored version of the script with these issues addressed:       ```python       # utils.py - Script to parse and summarize numeric CSV files        import csv       import os        def read_csv(filepath):           """Reads a CSV file and returns its contents as a list of rows."""           if not os.path.exists(filepath):               raise FileNotFoundError(f"The file {filepath} does not exist.")            with open(filepath, 'r') as f:               return [row for row in csv.reader(f)] |
|                             | def summarize_column(data, index):     values = [float(row[index]) for row in data[1:]] # skip header     total = sum(values)     avg = total / len(values)     return total, avg  def main():     filepath = 'data.csv'     data = read_csv(filepath)     total, avg = summarize_column(data, 1)     print("Total:", total)     print("Average:", avg)      if __name__ == '__main__':         main()                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             | def summarize_column(data, index):     values = [float(row[index]) for row in data[1:]] # skip header     total = sum(values)     avg = total / len(values)     return total, avg  def main():     filepath = 'data.csv'     data = read_csv(filepath)     total, avg = summarize_column(data, 1)     print("Total:", total)     print("Average:", avg)      if __name__ == '__main__':         main()                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | The provided utility script has several potential issues and areas for improvement. Here are some key points: <ul style="list-style-type: none"> <li>1. **Indentation Errors**: The script contains indentation errors, which will cause syntax errors when run.</li> <li>2. **Error Handling**: There is no error handling for file operations or CSV parsing, which could lead to crashes if the file is missing or malformed.</li> <li>3. **Magic Number**: The column index `1` is hardcoded, making the script less flexible.</li> <li>4. **Readability**: The script could be more readable with better variable naming and structure.</li> </ul> Here is the refactored version of the script with these issues addressed:       ```python       # utils.py - Script to parse and summarize numeric CSV files        import csv       import os        def read_csv(filepath):           """Reads a CSV file and returns its contents as a list of rows."""           if not os.path.exists(filepath):               raise FileNotFoundError(f"The file {filepath} does not exist.")            with open(filepath, 'r') as f:               return [row for row in csv.reader(f)] |                             | The provided utility script has several potential issues and areas for improvement. Here are some key points: <ul style="list-style-type: none"> <li>1. **Indentation Errors**: The script contains indentation errors, which will cause syntax errors when run.</li> <li>2. **Error Handling**: There is no error handling for file operations or CSV parsing, which could lead to crashes if the file is missing or malformed.</li> <li>3. **Magic Number**: The column index `1` is hardcoded, making the script less flexible.</li> <li>4. **Readability**: The script could be more readable with better variable naming and structure.</li> </ul> Here is the refactored version of the script with these issues addressed:       ```python       # utils.py - Script to parse and summarize numeric CSV files        import csv       import os        def read_csv(filepath):           """Reads a CSV file and returns its contents as a list of rows."""           if not os.path.exists(filepath):               raise FileNotFoundError(f"The file {filepath} does not exist.")            with open(filepath, 'r') as f:               return [row for row in csv.reader(f)] |
|                             | if __name__ == '__main__':     main()                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | if __name__ == '__main__':     main()                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                             | ### Changes Made:       1. **Indentation Fixed**: Corrected the indentation issues.       2. **Error Handling**: Added error handling for file existence and invalid indices.       3. **Magic Number Handling**: Made the column index a parameter to `summarize_column`.       4. **Readability**: Improved variable names and added docstrings for better readability.       5. **File Existence Check**: Added a check to ensure the file exists before attempting to read it.       6. **Division by Zero**: Added a check to avoid division by zero in case the 'values' list is empty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             | ### Changes Made:       1. **Error Handling**: Added error handling for file existence and invalid indices.       2. **Magic Number Handling**: Made the column index a parameter to `summarize_column`.       3. **Readability**: Improved variable names and added docstrings for better readability.       4. **File Existence Check**: Added a check to ensure the file exists before attempting to read it.       5. **Division by Zero**: Added a check to avoid division by zero in case the 'values' list is empty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Chat Data                   | This refactored script should be more robust, readable, and maintainable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Chat Data                   | This refactored script should be more robust, readable, and maintainable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

The codestratal code seems to classify more errors, but the GPT-4o output making changes is much longer this time.

21.2

| Number                                                                                                                                                                                                                             | 21                        | Number                                                                                                                                                                                                                             | 21                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Type                                                                                                                                                                                                                               | Chain-of-thought          | Type                                                                                                                                                                                                                               | Chain-of-thought   |
| Goal                                                                                                                                                                                                                               |                           | Goal                                                                                                                                                                                                                               |                    |
| Model                                                                                                                                                                                                                              | Codetral 25.01 Transcript | Model                                                                                                                                                                                                                              | OpenAI GPT-4o mini |
| Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                        |                           | Temperature: .7 Token Limit: 1024 Top-P: .9                                                                                                                                                                                        |                    |
| Work step by step to do this and analyze the steps. Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety!"                 |                           | Work step by step to do this and analyze the steps. Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety!"                 |                    |
| '''                                                                                                                                                                                                                                |                           | '''                                                                                                                                                                                                                                |                    |
| # utils.py - Script to parse and summarize numeric CSV files                                                                                                                                                                       |                           | # utils.py - Script to parse and summarize numeric CSV files                                                                                                                                                                       |                    |
| import csv                                                                                                                                                                                                                         |                           | import csv                                                                                                                                                                                                                         |                    |
| def read_csv(filepath):                                                                                                                                                                                                            |                           | def read_csv(filepath):                                                                                                                                                                                                            |                    |
| with open(filepath, 'r') as f:                                                                                                                                                                                                     |                           | with open(filepath, 'r') as f:                                                                                                                                                                                                     |                    |
| return [row for row in csv.reader(f)]                                                                                                                                                                                              |                           | return [row for row in csv.reader(f)]                                                                                                                                                                                              |                    |
| def summarize_column(data, index):                                                                                                                                                                                                 |                           | def summarize_column(data, index):                                                                                                                                                                                                 |                    |
| values = [float(row[index]) for row in data[1:]] # skip header                                                                                                                                                                     |                           | values = [float(row[index]) for row in data[1:]] # skip header                                                                                                                                                                     |                    |
| total = sum(values)                                                                                                                                                                                                                |                           | total = sum(values)                                                                                                                                                                                                                |                    |
| avg = total / len(values)                                                                                                                                                                                                          |                           | avg = total / len(values)                                                                                                                                                                                                          |                    |
| return total, avg                                                                                                                                                                                                                  |                           | return total, avg                                                                                                                                                                                                                  |                    |
| def main():                                                                                                                                                                                                                        |                           | def main():                                                                                                                                                                                                                        |                    |
| filepath = 'data.csv'                                                                                                                                                                                                              |                           | filepath = 'data.csv'                                                                                                                                                                                                              |                    |
| data = read_csv(filepath)                                                                                                                                                                                                          |                           | data = read_csv(filepath)                                                                                                                                                                                                          |                    |
| total, avg = summarize_column(data, 1)                                                                                                                                                                                             |                           | total, avg = summarize_column(data, 1)                                                                                                                                                                                             |                    |
| print("Total:\\\\", total)                                                                                                                                                                                                         |                           | print("Total:\\\\", total)                                                                                                                                                                                                         |                    |
| print("Average:\\\\", avg)                                                                                                                                                                                                         |                           | print("Average:\\\\", avg)                                                                                                                                                                                                         |                    |
| if __name__ == '__main__':                                                                                                                                                                                                         |                           | if __name__ == '__main__':                                                                                                                                                                                                         |                    |
| main()                                                                                                                                                                                                                             |                           | main()                                                                                                                                                                                                                             |                    |
| '''                                                                                                                                                                                                                                |                           | '''                                                                                                                                                                                                                                |                    |
| "timestamp": "2025-04-28T10:04:47.604Z",                                                                                                                                                                                           |                           | "timestamp": "2025-04-28T10:04:51.417Z",                                                                                                                                                                                           |                    |
| "role": "user",                                                                                                                                                                                                                    |                           | "role": "user",                                                                                                                                                                                                                    |                    |
| "message": "Work step by step to do this and analyze the steps. Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety!"\\\" |                           | "message": "Work step by step to do this and analyze the steps. Analyze the following utility script. Identify any potential logic issues or design flaws. Then, refactor it for better readability, correctness, and safety!"\\\" |                    |
| '''                                                                                                                                                                                                                                |                           | '''                                                                                                                                                                                                                                |                    |
| # utils.py - Script to parse and summarize numeric CSV files,                                                                                                                                                                      |                           | # utils.py - Script to parse and summarize numeric CSV files,                                                                                                                                                                      |                    |
| \\ import csv\\                                                                                                                                                                                                                    |                           | \\ import csv\\                                                                                                                                                                                                                    |                    |
| \\ \\                                                                                                                                                                                                                              |                           | \\ \\                                                                                                                                                                                                                              |                    |
| def read_csv(filepath):                                                                                                                                                                                                            |                           | def read_csv(filepath):                                                                                                                                                                                                            |                    |
| with open(filepath, 'r') as f:\\                                                                                                                                                                                                   |                           | with open(filepath, 'r') as f:\\                                                                                                                                                                                                   |                    |
| return [row for row in csv.reader(f)]\\                                                                                                                                                                                            |                           | return [row for row in csv.reader(f)]\\                                                                                                                                                                                            |                    |
| def summarize_column(data, index):                                                                                                                                                                                                 |                           | def summarize_column(data, index):                                                                                                                                                                                                 |                    |
| values = [float(row[index]) for row in data[1:]] # skip header\\                                                                                                                                                                   |                           | values = [float(row[index]) for row in data[1:]] # skip header\\                                                                                                                                                                   |                    |
| total = sum(values)\\                                                                                                                                                                                                              |                           | total = sum(values)\\                                                                                                                                                                                                              |                    |
| avg = total / len(values)\\                                                                                                                                                                                                        |                           | avg = total / len(values)\\                                                                                                                                                                                                        |                    |
| return total, avg\\                                                                                                                                                                                                                |                           | return total, avg\\                                                                                                                                                                                                                |                    |
| def main():                                                                                                                                                                                                                        |                           | def main():                                                                                                                                                                                                                        |                    |
| filepath = 'data.csv'                                                                                                                                                                                                              |                           | filepath = 'data.csv'                                                                                                                                                                                                              |                    |
| data = read_csv(filepath)                                                                                                                                                                                                          |                           | data = read_csv(filepath)                                                                                                                                                                                                          |                    |
| total, avg = summarize_column(data, 1)                                                                                                                                                                                             |                           | total, avg = summarize_column(data, 1)                                                                                                                                                                                             |                    |
| print("Total\\\\\\", total)\\                                                                                                                                                                                                      |                           | print("Total\\\\\\", total)\\                                                                                                                                                                                                      |                    |
| print("Average\\\\\\", avg)\\                                                                                                                                                                                                      |                           | print("Average\\\\\\", avg)\\                                                                                                                                                                                                      |                    |
| if __name__ == '__main__':                                                                                                                                                                                                         |                           | if __name__ == '__main__':                                                                                                                                                                                                         |                    |
| main()                                                                                                                                                                                                                             |                           | main()                                                                                                                                                                                                                             |                    |
| '''                                                                                                                                                                                                                                |                           | '''                                                                                                                                                                                                                                |                    |
| "timestamp": "2025-04-28T10:04:58.462Z",                                                                                                                                                                                           |                           | "timestamp": "2025-04-28T10:05:05.915Z",                                                                                                                                                                                           |                    |
| "role": "assistant",                                                                                                                                                                                                               |                           | "role": "assistant",                                                                                                                                                                                                               |                    |
| "message": "Let's analyze the given utility script step by step to identify potential logic issues or design flaws, and then refactor it for better readability, correctness, and safety.                                          |                           | "message": "Let's analyze the provided utility script step by step, identifying any potential logic issues or design flaws, and then refactor it for better readability, correctness, and safety.                                  |                    |
| ### Step-by-Step Analysis                                                                                                                                                                                                          |                           | ### Analysis of the Script                                                                                                                                                                                                         |                    |
| 1. **Import Statement**:                                                                                                                                                                                                           |                           | 1. **Imports**:                                                                                                                                                                                                                    |                    |
| ```python<br>import csv                                                                                                                                                                                                            |                           | - The script imports the 'csv' module which is essential for handling CSV files.                                                                                                                                                   |                    |
| This is correct and necessary for reading CSV files.                                                                                                                                                                               |                           | 2. **Function 'read_csv Function**:                                                                                                                                                                                                |                    |
| 2. **read_csv Function**:                                                                                                                                                                                                          |                           | - Opens a CSV file and reads its contents.<br>- Returns a list of rows, where each row is a list of values.                                                                                                                        |                    |
| ```python<br>def read_csv(filepath):<br>with open(filepath, 'r') as f:<br>return [row for row in csv.reader(f)]                                                                                                                    |                           | 3. **Issues**:                                                                                                                                                                                                                     |                    |
| ```                                                                                                                                                                                                                                |                           | - No error handling, e.g., if the file doesn't exist, or isn't a valid CSV file, it will raise an exception, causing the script to crash.                                                                                          |                    |
| 4. **Main Function**:                                                                                                                                                                                                              |                           | 3. **Function 'summarize_column(data, index)**:                                                                                                                                                                                    |                    |
| ```python<br>def main():                                                                                                                                                                                                           |                           | - Takes the data read from the CSV and an index for the column to summarize.                                                                                                                                                       |                    |
| filepath = 'data.csv'<br>data = read_csv(filepath)<br>total, avg = summarize_column(data, 1)<br>print("Total:\\\\", total)<br>print("Average:\\\\", avg)                                                                           |                           |                                                                                                                                                                                                                                    |                    |
| ```                                                                                                                                                                                                                                |                           |                                                                                                                                                                                                                                    |                    |
| 5. **Issues**:                                                                                                                                                                                                                     |                           |                                                                                                                                                                                                                                    |                    |
| - Handcoding the file path and column index can make the script less flexible.<br>- "Solution": Make the file path and column index configurable through arguments or configuration files.                                         |                           |                                                                                                                                                                                                                                    |                    |
| 6. **Script Execution**:                                                                                                                                                                                                           |                           |                                                                                                                                                                                                                                    |                    |
| ```python<br>if __name__ == '__main__':<br>main()<br>...<br>This is correct and necessary for running the script.                                                                                                                  |                           |                                                                                                                                                                                                                                    |                    |
| ```                                                                                                                                                                                                                                |                           |                                                                                                                                                                                                                                    |                    |
| 7. **Refactored Script                                                                                                                                                                                                             |                           |                                                                                                                                                                                                                                    |                    |
| Here is the refactored script with improvements for readability, correctness, and safety:                                                                                                                                          |                           |                                                                                                                                                                                                                                    |                    |
| ```python<br># utils.py - Script to parse and summarize numeric CSV files<br><br>import csv<br>import sys                                                                                                                          |                           |                                                                                                                                                                                                                                    |                    |

22,1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Zero-Shot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Codestrail 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Temperature: .7 Token Limit:<br>1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <pre>Complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  Sure, I can help you complete the script. The 'clean_line' function needs to remove punctuation and convert the line to lowercase. Here's the completed script:</pre> | <pre>Complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  Sure, I can help you complete the script. The 'clean_line' function needs to remove punctuation and convert the line to lowercase. Here's the completed script:</pre> | <pre>Complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  Sure, I can help you complete the script by implementing the 'clean_line' function to remove punctuation and convert the text to lowercase. Here's the updated code:</pre> | <pre>```python # file_processor.py - Complete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # Remove punctuation and make lowercase     translator = str.maketrans("", "", string.punctuation)     return line.translate(translator).lower()  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main() ```  #### Explanation of Changes: 1. **`clean_line` Function**:     - Uses `str.maketrans` to create a translation table that maps each punctuation character to 'None'.     - Translates the line using this table to remove punctuation.     - Converts the line to lowercase.  2. **`count_words` Function**:     - Calls `clean_line` to process each line.     - Splits the cleaned line into words and updates the word counts dictionary.  3. **`main` Function**:     - Loads the file, processes the lines, counts the words, and prints the results.</pre> <p>This script should now correctly clean each line by removing punctuation and converting to lowercase, and count the word frequencies</p> |

Both models seem to have the exact new code output for the file in this manner, showing that they had similar trains of thought while working through it.

## 22.2

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Chain-of-thought                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Chain-of-thought                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Codestrail 25.01 Transcript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | OpenAI GPT-4o mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Temperature: .7 Token Limit:<br>Limit: 1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Temperature: .7 Token Limit:<br>1024 Top-P: .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <pre>Working step by step, complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  [     {         "timestamp": "2025-04-28T10:07:09.293Z",         "role": "user",     } ]</pre> | <pre>Working step by step, complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  [     {         "timestamp": "2025-04-28T10:07:09.293Z",         "role": "user",     } ]</pre> | <pre>Working step by step, complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  [     {         "timestamp": "2025-04-28T10:07:09.293Z",         "role": "user",     } ]</pre> | <pre>Working step by step, complete the following file-processing script. The goal is to clean each line, remove punctuation, and count word frequencies correctly: `# file_processor.py - Incomplete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # TODO: Remove punctuation and make lowercase     pass  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f"\t{word}: {count}\t")  if __name__ == '__main__':     main()  [     {         "timestamp": "2025-04-28T10:07:09.293Z",         "role": "user",     } ]</pre> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> Here is the completed script:  ```python # file_processor.py - Complete script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # Remove punctuation and make lowercase     translator = str.maketrans("", "", string.punctuation)     return line.translate(translator).lower()  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f'{word}: {count}!`)  if __name__ == '__main__':     main() ``` </pre> <p>#### Explanation of the Changes:</p> <ol style="list-style-type: none"> <li>1. **clean_line Function:**<br/> <ul style="list-style-type: none"> <li>- `str.maketrans("", "", string.punctuation)` : This creates a translation table that maps each punctuation character to 'None'.</li> <li>- `line.translate(translator)` : This removes all punctuation from the line.</li> <li>- `lower()` : This converts the line to lowercase.</li> </ul> </li> <li>2. **count_words Function:**<br/> <ul style="list-style-type: none"> <li>- This function remains largely unchanged but now correctly processes each line after it has been cleaned.</li> </ul> </li> </ol> | <pre> Here's the completed script:  ```python # file_processor.py - Script for processing text files  import string  def load_file(filepath):     with open(filepath, 'r') as f:         return f.readlines()  def clean_line(line):     # Remove punctuation and make lowercase     # Use str.translate to remove punctuation     line = line.translate(str.maketrans("", "", string.punctuation))     return line.lower().strip() # Convert to lowercase and strip whitespace  def count_words(lines):     word_counts = {}     for line in lines:         clean = clean_line(line)         for word in clean.split():             word_counts[word] = word_counts.get(word, 0) + 1     return word_counts  def main():     filepath = 'input.txt'     lines = load_file(filepath)     counts = count_words(lines)     for word, count in sorted(counts.items()):         print(f'{word}: {count}!`)  if __name__ == '__main__':     main() ``` </pre> <p>#### Changes Made:</p> <ol style="list-style-type: none"> <li>1. **Implemented 'clean_line' Function:**<br/> <ul style="list-style-type: none"> <li>- Used `str.translate` along with `string.punctuation` to remove punctuation from the line.</li> <li>- Converted the line to lowercase using `lower()` and stripped any extra whitespace.</li> </ul> </li> <li>2. **Fixed Indentation:**<br/> <ul style="list-style-type: none"> <li>- Ensured the indentation within the functions and loops was consistent and correct for Python.</li> </ul> </li> <li>3. **Corrected Print Statement:**</li> </ol> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

```

2. **count_words Function:**

- This function remains largely unchanged but now correctly processes each line after it has been cleaned.

3. **main Function:**

- This function remains largely unchanged but ensures that the file is read and processed correctly.

How to Use the Script:

1. **Prepare Input File:**

- Create a file named 'input.txt' in the same directory as the script.

- Add some text to 'input.txt'.

2. **Run the Script:**

- Execute the script using Python:

```sh
python file_processor.py
```


3. **Output:**

- The script will read 'input.txt', clean each line, count the frequencies of each word, and print the results in alphabetical order.

This should give you a complete and functional script for processing text files and counting word frequencies."
}
]

```

(You can run this script in a Python environment, ensuring that 'input.txt' is present in the directory. Adjust the file path as needed for your environment.)

In this case as well both codes seem to have made the same changes to the script too.

## General Thoughts

Seemed like there was pretty similar output between Codestral and GPT-4o mini. One big think I noticed however was differences in output size, where Codestral always seem to have longer output probably meaning it's less efficient right now at explaining things with the same amount of space.