

AI Assisted Coding

Assignment – 4

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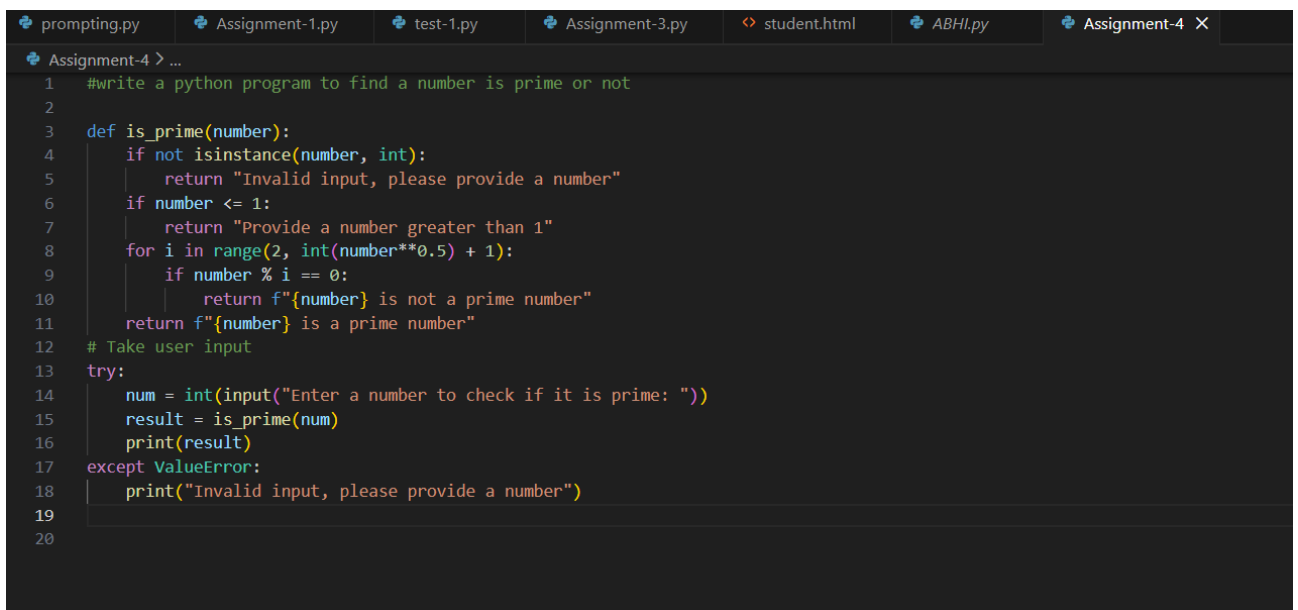
Batch: 22

HtNo: 2303A51677

Task Description-1

- Zero-shot: Prompt AI with only the instruction. Write a Python function to determine whether a given number is prime

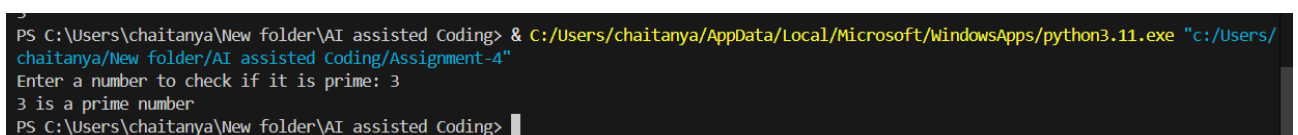
Code:

A screenshot of a code editor with multiple tabs. The active tab is 'Assignment-4'. The code is a Python program that defines a function 'is_prime' and uses it to check if a user-input number is prime. The code includes error handling for non-integer inputs.

```
1 #write a python program to find a number is prime or not
2
3 def is_prime(number):
4     if not isinstance(number, int):
5         return "Invalid input, please provide a number"
6     if number <= 1:
7         return "Provide a number greater than 1"
8     for i in range(2, int(number**0.5) + 1):
9         if number % i == 0:
10            return f"{number} is not a prime number"
11    return f"{number} is a prime number"
12 # Take user input
13 try:
14     num = int(input("Enter a number to check if it is prime: "))
15     result = is_prime(num)
16     print(result)
17 except ValueError:
18     print("Invalid input, please provide a number")
19
20
```

Output:

A basic Python function to check if a number is prime, demonstrating correct logical conditions without relying on examples or additional context.

A screenshot of a terminal window showing the command to run the Python program and its output. The user enters '3' as input, and the program correctly identifies it as a prime number.

```
PS C:\Users\chaitanya\New folder\AI assisted Coding> & C:/Users/chaitanya/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/chaitanya/New folder/AI assisted Coding/Assignment-4"
Enter a number to check if it is prime: 3
3 is a prime number
PS C:\Users\chaitanya\New folder\AI assisted Coding>
```

Final Observation:

is_prime(number):

function first checks whether the number is greater than 1, since prime numbers cannot be 0, 1, or negative.

It then tests divisibility only up to \sqrt{n} instead of $n-1$, improving efficiency.

If any number in this range divides n exactly, the function returns False.

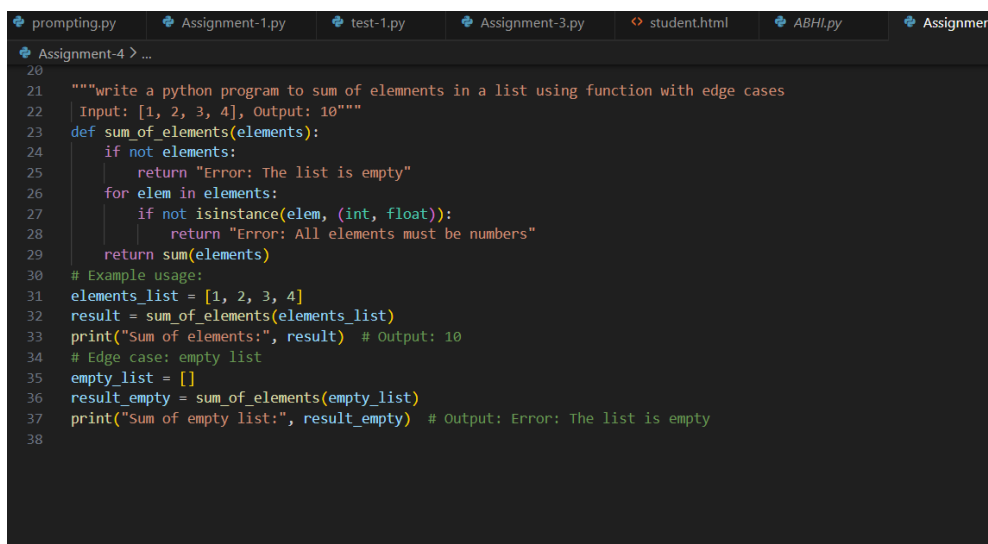
If no divisor is found, it returns True, confirming the number is prime.

This zero-shot-generated logic shows the AI's ability to apply mathematical reasoning without examples.

Task Description-2

- One-shot: Provide one example: Input: [1, 2, 3, 4], Output: 10 to help AI generate a function that calculates the sum of elements in a list.

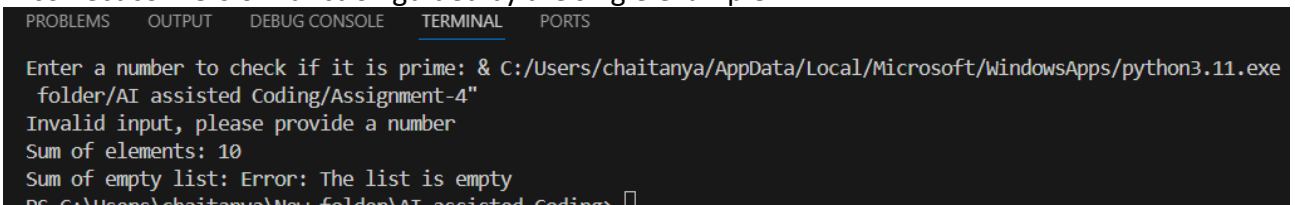
Code:



```
20
21 """write a python program to sum of elements in a list using function with edge cases
22 Input: [1, 2, 3, 4], Output: 10"""
23 def sum_of_elements(elements):
24     if not elements:
25         return "Error: The list is empty"
26     for elem in elements:
27         if not isinstance(elem, (int, float)):
28             return "Error: All elements must be numbers"
29     return sum(elements)
30 # Example usage:
31 elements_list = [1, 2, 3, 4]
32 result = sum_of_elements(elements_list)
33 print("Sum of elements:", result) # Output: 10
34 # Edge case: empty list
35 empty_list = []
36 result_empty = sum_of_elements(empty_list)
37 print("Sum of empty list:", result_empty) # Output: Error: The list is empty
38
```

Output:

A correct conversion function guided by the single example.



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Enter a number to check if it is prime: & C:/Users/chaitanya/AppData/Local/Microsoft/WindowsApps/python3.11.exe
folder/AI assisted Coding/Assignment-4"
Invalid input, please provide a number
Sum of elements: 10
Sum of empty list: Error: The list is empty
PS C:\Users\chaitanya\New folder\AI assisted Coding>
```

Final Observation:

The sum_of_elements(arr) function computes the sum of all values in a list by initializing an accumulator variable to zero.

It then iterates through each element of the list, adding every value to the accumulator step by step.

Once all elements have been processed, the accumulated value represents the total sum of the list.

The function finally returns this value as the output.

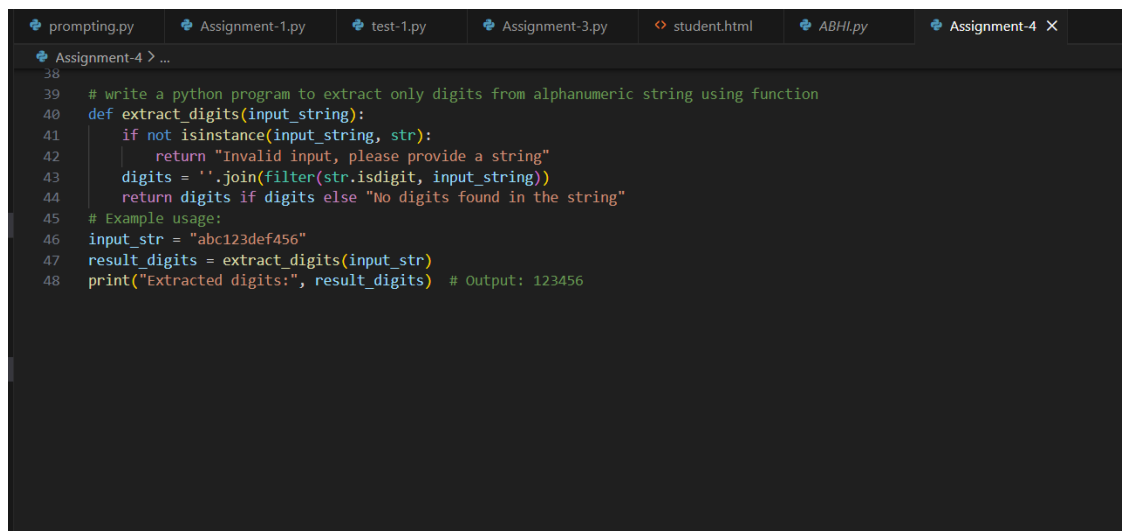
Because it was created using **one-shot prompting**, the single example provided helped the AI

accurately grasp the task and generate a clear and correct solution.

Task Description-3

- Few-shot: Give 2–3 examples to create a function that extracts digits from an alphanumeric string.

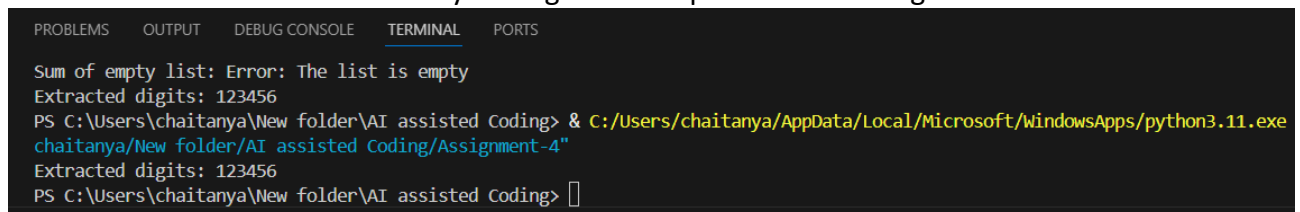
Code:



```
38
39 # write a python program to extract only digits from alphanumeric string using function
40 def extract_digits(input_string):
41     if not isinstance(input_string, str):
42         return "Invalid input, please provide a string"
43     digits = ''.join(filter(str.isdigit, input_string))
44     return digits if digits else "No digits found in the string"
45 # Example usage:
46 input_str = "abc123def456"
47 result_digits = extract_digits(input_str)
48 print("Extracted digits:", result_digits) # Output: 123456
```

Output:

Accurate function that returns only the digits from alphanumeric string.



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Sum of empty list: Error: The list is empty
Extracted digits: 123456
PS C:\Users\chaitanya\New folder\AI assisted Coding> & C:/Users/chaitanya/AppData/Local/Microsoft/WindowsApps/python3.11.exe
chaitanya\New folder\AI assisted Coding\Assignment-4"
Extracted digits: 123456
PS C:\Users\chaitanya\New folder\AI assisted Coding> 
```

Final Observation:

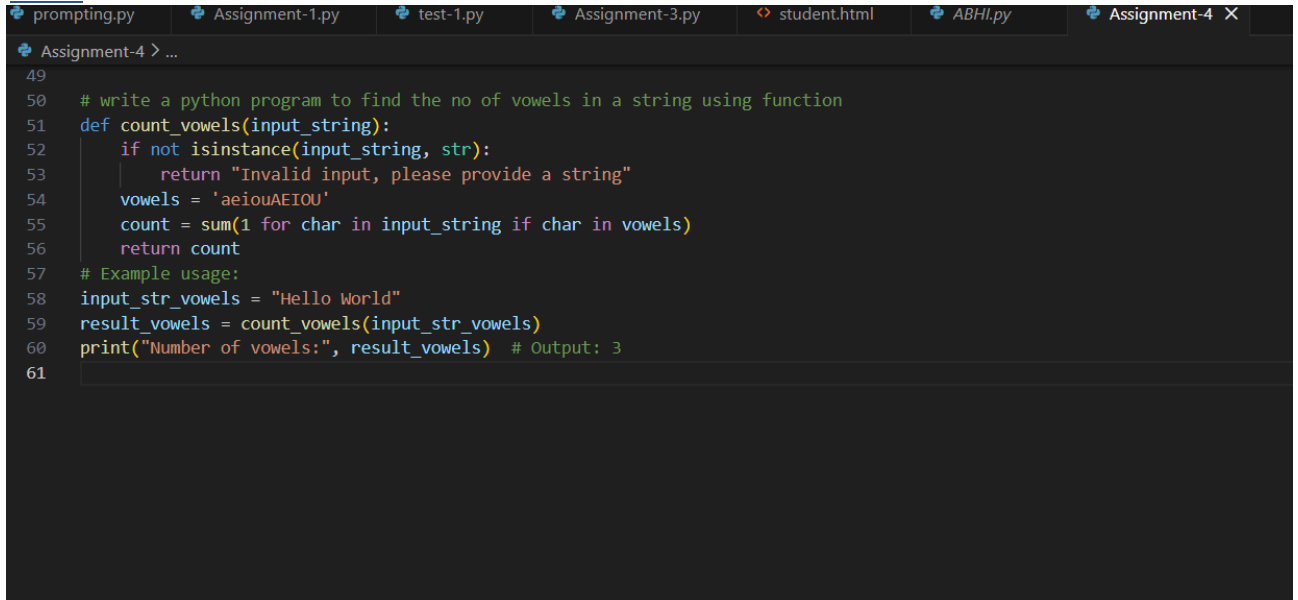
The `extract_digits(text)` function iterates through every character in the input string and determines whether it is a numeric character by using the `isdigit()` method. Whenever a digit is found, it is appended to the result string. Once all characters have been processed, the function returns a new string containing only the digits extracted from the original input. Since this function was created using few-shot prompting, the multiple examples helped the AI clearly identify the pattern of filtering out letters while retaining numbers, leading to a precise and dependable implementation.

Task Description-4

- Compare zero-shot vs few-shot prompting for generating a function that counts the number of vowels in a string.

Zero Shot:

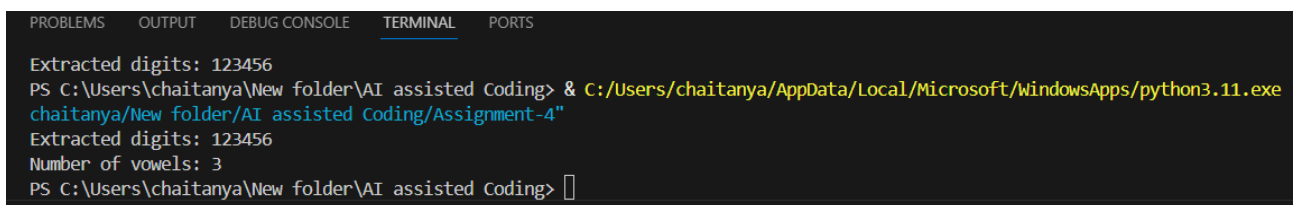
Code:



```
prompting.py Assignment-1.py test-1.py Assignment-3.py student.html ABHI.py Assignment-4 X
Assignment-4 > ...
49
50 # write a python program to find the no of vowels in a string using function
51 def count_vowels(input_string):
52     if not isinstance(input_string, str):
53         return "Invalid input, please provide a string"
54     vowels = 'aeiouAEIOU'
55     count = sum(1 for char in input_string if char in vowels)
56     return count
57 # Example usage:
58 input_str_vowels = "Hello World"
59 result_vowels = count_vowels(input_str_vowels)
60 print("Number of vowels:", result_vowels) # Output: 3
61
```

Output:

Output comparison + student explanation on how examples helped the model.



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Extracted digits: 123456
PS C:\Users\chaitanya\New folder\AI assisted Coding> & C:/Users/chaitanya/AppData/Local/Microsoft/WindowsApps/python3.11.exe
chaitanya\New folder\AI assisted Coding\Assignment-4"
Extracted digits: 123456
Number of vowels: 3
PS C:\Users\chaitanya\New folder\AI assisted Coding>
```

Output Comparison:

Few-shot version:

Guided by the provided examples, the model clearly understood that vowels in both uppercase and lowercase needed to be counted. This resulted in a more confident, optimized, and compact implementation of the function.

Zero-shot version:

The function remains correct and easy to understand, relying on a straightforward loop and a counter variable to achieve the desired result.

Final Observation:

In the zero-shot approach, the AI produced a simple vowel-counting function by relying only on the instruction, resulting in a basic solution that used a loop. In contrast, the few-shot approach included clear examples that demonstrated which characters should be treated as vowels and what the expected output should be. These examples helped the AI understand the pattern more effectively, leading to a cleaner, better-structured, and slightly optimized solution. This comparison highlights how providing examples improves clarity and often results in more accurate and reliable outputs.

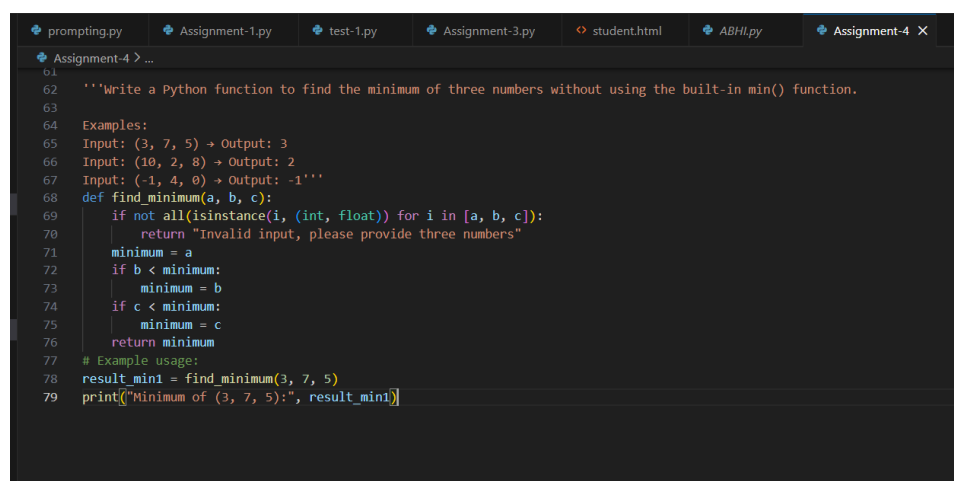
Task Description-5

- Use few-shot prompting with 3 sample inputs to generate a function that determines the minimum of three numbers without using the built-in `min()` function.

Expected Output-5

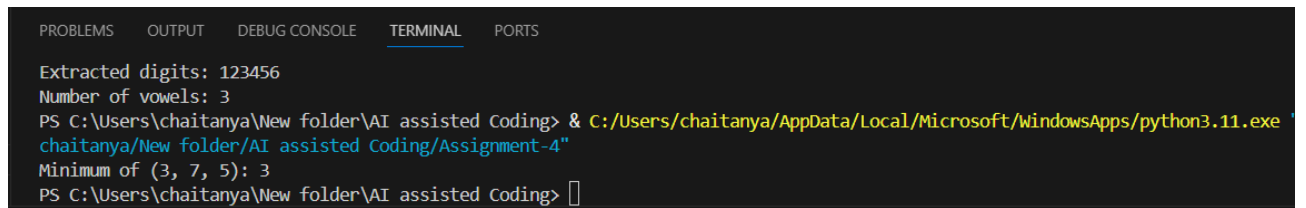
- A function that handles all cases with correct logic based on example patterns.

Code:



```
01.
02. '''Write a Python function to find the minimum of three numbers without using the built-in min() function.
03.
04. Examples:
05. Input: (3, 7, 5) → Output: 3
06. Input: (10, 2, 8) → Output: 2
07. Input: (-1, 4, 0) → Output: -1'''
08. def find_minimum(a, b, c):
09.     if not all(isinstance(i, (int, float)) for i in [a, b, c]):
10.         return "Invalid input, please provide three numbers"
11.     minimum = a
12.     if b < minimum:
13.         minimum = b
14.     if c < minimum:
15.         minimum = c
16.     return minimum
17.
18. # Example usage:
19. result_min1 = find_minimum(3, 7, 5)
20. print("Minimum of (3, 7, 5):", result_min1)
```

Output:



```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

Extracted digits: 123456
Number of vowels: 3
PS C:\Users\chaitanya\New folder\AI assisted Coding> & C:/Users/chaitanya/AppData/Local/Microsoft/WindowsApps/python3.11.exe "chaitanya/New folder\AI assisted Coding\Assignment-4"
Minimum of (3, 7, 5): 3
PS C:\Users\chaitanya\New folder\AI assisted Coding> 
```

Final Observation:

`find_minimum(a, b, c)` function determines the smallest of three numbers by using conditional statements. It first verifies whether `a` is less than or equal to both `b` and `c`. If that condition fails, it then checks whether `b` is less than or equal to the remaining values. If neither condition is satisfied, the function returns `c` as the minimum. Because this function was created using few-shot prompting, the provided examples clearly illustrated the comparison pattern and expected output, enabling the AI to design logic that works correctly for all cases, including negative numbers.