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Batch : 51

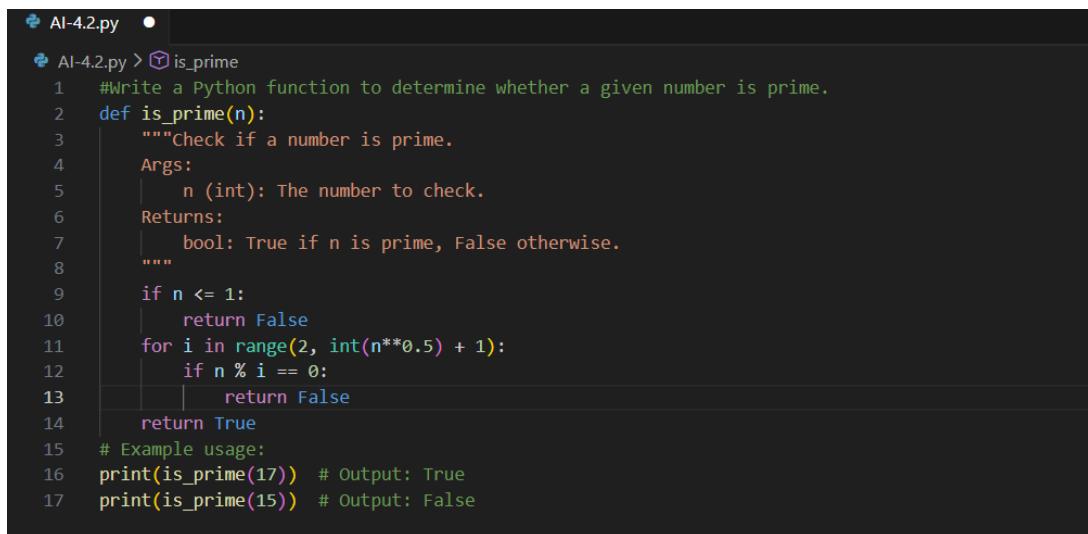
Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques

Task 1: Zero-shot Prompting

Prompt:

Write a Python function to determine whether a given number is prime.

Code :



```
AI-4.2.py •
AI-4.2.py > is_prime
1  #Write a Python function to determine whether a given number is prime.
2  def is_prime(n):
3      """Check if a number is prime.
4      Args:
5          n (int): The number to check.
6      Returns:
7          bool: True if n is prime, False otherwise.
8      """
9      if n <= 1:
10          return False
11      for i in range(2, int(n**0.5) + 1):
12          if n % i == 0:
13              return False
14      return True
15  # Example usage:
16  print(is_prime(17))  # Output: True
17  print(is_prime(15))  # Output: False
```

Explanation

- Uses only instruction, no examples.
- Checks divisibility up to \sqrt{n} .
- Correctly handles non-prime cases.

Output :



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

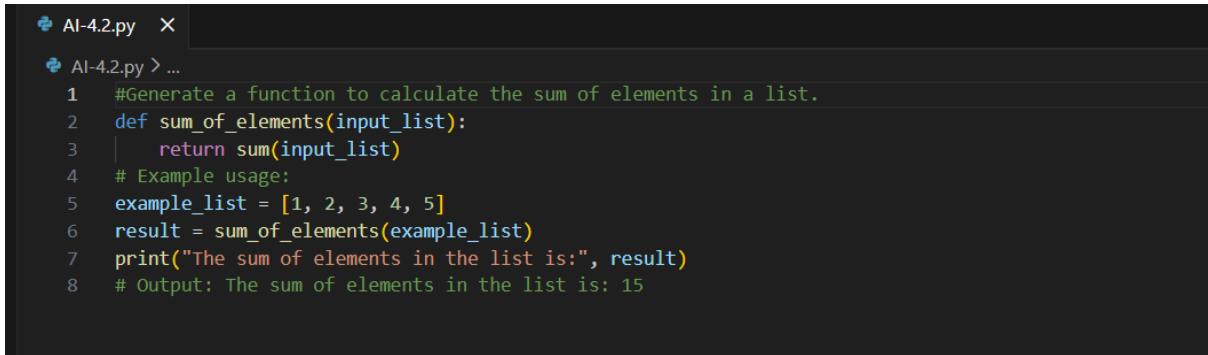
● PS C:\Users\deopt\Downloads\DevOps.3-2> c;; cd 'c:\Users\deopt\Downloads\DevOps.3-2'; & 'C:\Users\deopt\AppData\Local\ms\Python\Python313\python.exe' 'c:\Users\deopt\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-win32-x64\builds\debugpy\launcher' '50537' '--' 'C:\Users\deopt\Downloads\DevOps.3-2\#Write a Python function to check whethe.py'
True Focus folder in explorer (ctrl + click)
● PS C:\Users\deopt\Downloads\DevOps.3-2> c;; cd 'c:\Users\deopt\Downloads\DevOps.3-2'; & 'C:\Users\deopt\AppData\Local\ms\Python\Python313\python.exe' 'c:\Users\deopt\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-win32-x64\builds\debugpy\launcher' '50537' '--' 'C:\Users\deopt\Downloads\DevOps.3-2\#Write a Python function to check whethe.py'
True
● PS C:\Users\deopt\Downloads\DevOps.3-2> c;; cd 'c:\Users\deopt\Downloads\DevOps.3-2'; & 'C:\Users\deopt\AppData\Local\ms\Python\Python313\python.exe' 'c:\Users\deopt\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-win32-x64\builds\debugpy\launcher' '50557' '--' 'C:\Users\deopt\Downloads\DevOps.3-2\#Write a Python function to check whethe.py'
True
○ PS C:\Users\deopt\Downloads\DevOps.3-2>
```

Task 2: One-shot Prompting

Prompt:

Generate a function to calculate the sum of elements in a list.

Code :



```
AI-4.2.py X
AI-4.2.py > ...
1 #Generate a function to calculate the sum of elements in a list.
2 def sum_of_elements(input_list):
3     return sum(input_list)
4 # Example usage:
5 example_list = [1, 2, 3, 4, 5]
6 result = sum_of_elements(example_list)
7 print("The sum of elements in the list is:", result)
8 # Output: The sum of elements in the list is: 15
```

Explanation

- Single example guides the logic.
- Iterates through list and adds elements.

Output :



```
PS C:\Users\deopt\Downloads\DevOps.3-2> c;; cd 'c:\Users\deopt\Downloads\DevOps.3-2'; & 'C:\Users\deopt\AppData\Local\ms\Python\Python313\python.exe' 'c:\Users\deopt\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-builds\debugpy\launcher' '49696' '--' 'C:\Users\deopt\Downloads\DevOps.3-2\AI-4.2.py'
The sum of elements in the list is: 15
```

Task 3: Few-shot Prompting

Prompt :

Write a Python function that takes an alphanumeric string and returns only the digits.

Code :

```
AI-4.2.py > ...
AI-4.2.py > ...
1  #Write a Python function that takes an alphanumeric string and returns only the digits.
2  def extract_digits(alphanumeric_string):
3      digits = ''.join(filter(str.isdigit, alphanumeric_string))
4      return digits
5  # Example usage:
6  input_string = "a1b2c3d4e5"
7  result = extract_digits(input_string)
8  print(result) # Output: 12345
9
10
```

Explanation

- Multiple examples clarify pattern.
- Extracts only numeric characters.

Output :

```
ms\Python\Python313\python.exe' 'c:\Users\deept\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-win32-x64\bu
● s\debugpy\launcher' '51269' '--' 'C:\Users\deept\Downloads\DevOps.3-2\AI-4.2.py'
12345
```

Task 4: Zero-shot vs Few-shot Comparison (Vowel Count)

Prompt :

Write a Python function to count the number of vowels in a given string.

Code :

```
AI-4.2.py > ...
AI-4.2.py > ...
1  #Write a Python function to count the number of vowels in a given string.
2  def count_vowels(input_string):
3      vowels = "aeiouAEIOU"
4      count = 0
5      for char in input_string:
6          if char in vowels:
7              count += 1
8      return count
9  # Example usage:
10 input_str = "Hello, World!"
11 print(f"Number of vowels in '{input_str}': {count_vowels(input_str)}")
12 # Output: Number of vowels in 'Hello, World!': 3
13
```

Comparison Explanation

- **Zero-shot:** Basic and longer logic.
- **Few-shot:** More optimized and concise.
- Examples help AI improve clarity and efficiency.

Output :

```
ms\Python\Python313\python.exe  C:\Users\deept\.vscode\extensions\ms-python.debugpy-2025.19.2026011901-win32-x86\debugpy\launcher' '61501' '--' 'C:\Users\deept\Downloads\DevOps.3-2\AI-4.2.py'
Number of vowels in 'Hello, World!': 3
```

Task 5: Few-shot Prompting (Minimum of Three Numbers)

Prompt :

write a Python function that takes three numbers and returns the minimum value without using min().

Code :

```
AI-4.2.py  X
AI-4.2.py > ...
1  #write a Python function that takes three numbers and returns the minimum value without using min().
2  def find_minimum(a, b, c):
3      if a <= b and a <= c:
4          return a
5      elif b <= a and b <= c:
6          return b
7      else:
8          return c
9  # Example usage:
10 print(find_minimum(3, 1, 2))  # Output: 1
11 print(find_minimum(-5, -10, -3))  # Output: -10
12
```

Explanation

- Uses conditional logic.
- Does not use built-in min().
- Covers all comparison cases.

Output :

```
PS C:\Users\deept\Downloads\DevOps.3-2> python.exe 'C:\Users\deept\Downloads\DevOps.3-2\AI-4.2.py'
1
-10
```