Assignment-2.1

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Batch-17

Task 1: Statistical Summary for Survey Data

❖ Scenario:

You are a data analyst intern working with survey responses stored as

numerical lists.

❖ Task:

Use Google Gemini in Colab to generate a Python function that reads a list

of numbers and calculates the mean, minimum, and maximum values.

❖ Expected Output:

➢ Correct Python function

➢ Output shown in Colab

➢ Screenshot of Gemini prompt and result

PROMPT:

Write a Python function that takes a list of numbers from user input and calculates mean, minimum, and maximum values. Handle empty input and display results clearly.

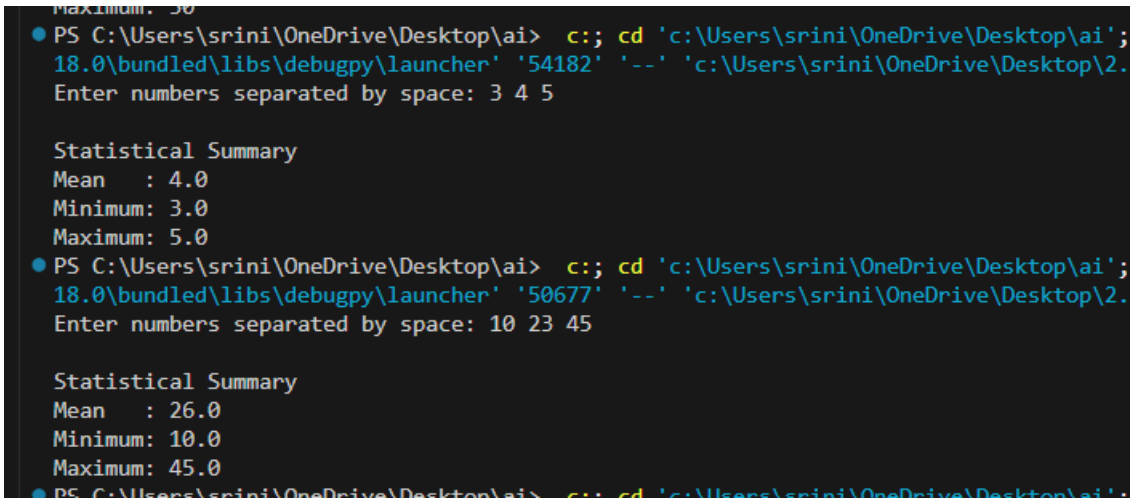
CODE:

```
def statistical_summary(data):
    if not data:
        print("List is empty. No statistics available.")
        return
    mean_val = sum(data) / len(data)
    min_val = min(data)
    max_val = max(data)
    print("\nStatistical Summary")
    print("Mean   :", mean_val)
    print("Minimum:", min_val)
```

```
    print("Maximum:", max_val)

nums = list(map(float, input("Enter numbers separated by space: ").split()))

statistical_summary(nums)
```



Explanation Steps :

1. Take numbers from user using input().
2. Convert input into list using split() and map().
3. Calculate mean using sum()/len().
4. Use min() and max() functions.
5. Print results.

Task 2: Armstrong Number – AI Comparison

❖ Scenario:

You are evaluating AI tools for numeric validation logic.

❖ Task:

Generate an Armstrong number checker using Gemini and GitHub

Copilot.

Compare their outputs, logic style, and clarity.

❖ Expected Output:

➢ Side-by-side comparison table

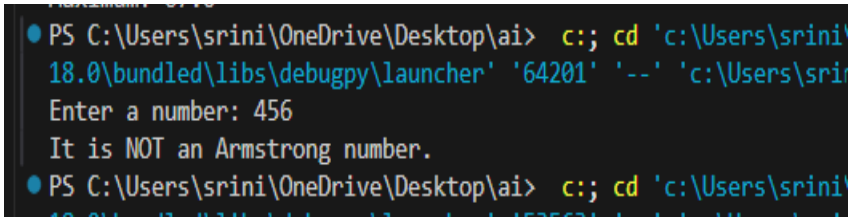
➢ Screenshots of prompts and generated code

PROMPT:

Write a Python program to check whether a number is an Armstrong number. Take input from the user and print the result with clear logic and comments.

CODE:

```
def is_armstrong(num):
    digits = len(str(num))
    temp = num
    total = 0
    while temp > 0:
        digit = temp % 10
        total += digit ** digits
        temp //= 10
    return total == num
number = int(input("Enter a number: "))
if is_armstrong(number):
    print("It is an Armstrong number.")
else:
    print("It is NOT an Armstrong number.")
```



Explanation Steps:

1. Take number as input.
2. Count digits using len(str()).
3. Extract each digit.
4. Raise digit to power of digits and sum.
5. Compare with original number.

Task 3: Leap Year Validation Using Cursor AI

❖ Scenario:

You are validating a calendar module for a backend system.

❖ Task:

Use Cursor AI to generate a Python program that checks whether a given year is a leap year.

Use at least two different prompts and observe changes in code.

❖ Expected Output:

➢ Two versions of code

➢ Sample inputs/outputs

➢ Brief comparison

PROMPT:

Write a simple Python program to check leap year using if-else.

CODE:

```
year = int(input("Enter a year: "))
if year % 4 == 0:
    if year % 100 == 0:
        if year % 400 == 0:
            print("Leap Year")
        else:
            print("Not a Leap Year")
    else:
        print("Leap Year")
else:
    print("Not a Leap Year")
```

```
PS C:\Users\srini\OneDrive\Desktop\ai>  c:; cd 'c:\Us
18.0\bundled\libs\debugpy\launcher' '53563' '--' 'c:\
Enter a year: 2028
Leap Year
```

Explanation Steps:

1. Take year as input.
2. Check divisibility rules:
    - divisible by 4
    - not divisible by 100 unless divisible by 400
3. Print result.

Task 4: Student Logic + AI Refactoring (Odd/Even Sum)

❖ Scenario:

Company policy requires developers to write logic before using AI.

❖ Task:

Write a Python program that calculates the sum of odd and even numbers

in a tuple, then refactor it using any AI tool.

❖ Expected Output:

➢ Original code

➢ Refactored code

➢ Explanation of improvements

PROMPT:

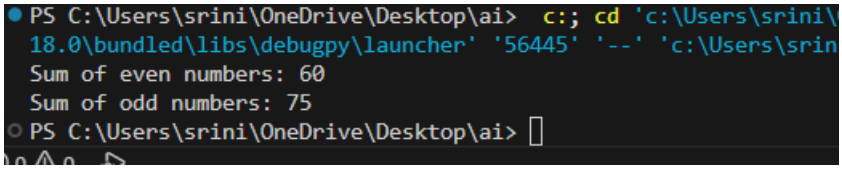
Refactor my Python code that calculates sum of odd and even numbers in a tuple. Make it cleaner, reusable, and more Pythonic.

CODE:

```
numbers = (10, 15, 20, 25, 30, 35)
even_sum = 0
odd_sum = 0
for num in numbers:
  if num % 2 == 0:
    even_sum += num
  else:
    odd_sum += num
```

print("Sum of even numbers:", even_sum)

print("Sum of odd numbers:", odd_sum)



Explanation Steps:

1. Loop through tuple.
2. Check even/odd using % 2.
3. Add to respective sums.
4. AI refactors into function.
5. Uses sum() and generator expressions