AI ASSISTED CODING

ASSIGMENT 2.2

PROGRAM: B.TECH/CSE

SPECIALIZATION :AIML

NAME : B.Srinithi

ENROLLMENT NO :2403A51413

COURSE : AI ASSISTED CODE

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BATCH :01

#TASK DESCRIPTION 1:

Use Gemini in Colab to write a function that filters out all negative numbers from a given list

PROMPT:

Develop a code of function that filters out all negative numbers from a given list

EXPECTED OUTPUT 1:

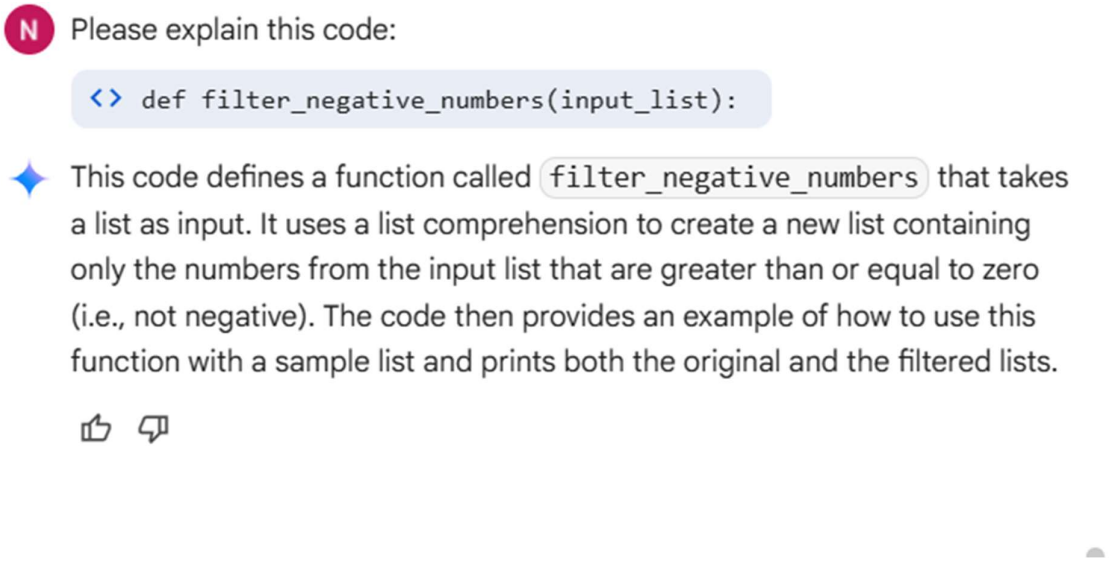
Functional code with before/after input and output shown in Colab, plus a screenshot

```python
def filter_negative_numbers(input_list):
  """Filters out negative numbers from a list."""
  return [num for num in input_list if num >= 0]

# Example usage
my_list = [1, -2, 3, -4, 5, 0, -6]
filtered_list = filter_negative_numbers(my_list)
print(f"Original list: {my_list}")
print(f"Filtered list (without negative numbers): {filtered_list}")
```

```
Original list: [1, -2, 3, -4, 5, 0, -6]
Filtered list (without negative numbers): [1, 3, 5, 0]
```

EXPLANATION 1:



#TASK DESCRIPTION 2:

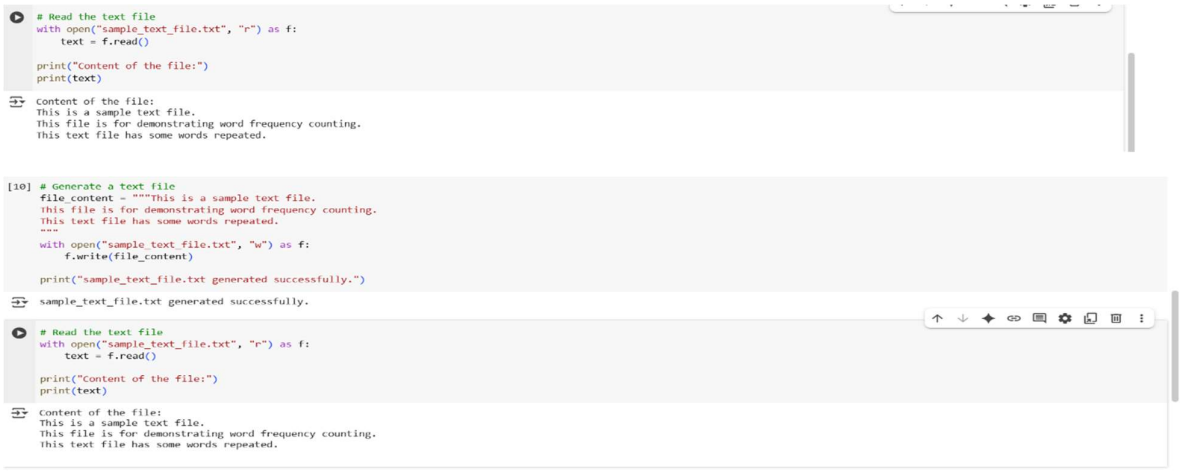
Ask Gemini to generate code that reads a text file and counts the frequency of each word. Then ask it to explain the code

PROMPT:

Develop a code to generate a text file and counts the frequency of each word

EXPECTED OUTPUT 2:

Working code and Gemini's explanation side-by-side



```
# Read the text file
with open("sample_text_file.txt", "r") as f:
    text = f.read()

print("Content of the file:")
print(text)
```

```
Content of the file:
This is a sample text file.
This file is for demonstrating word frequency counting.
This text file has some words repeated.
```

```
[10] # Generate a text file
file_content = """This is a sample text file.
This file is for demonstrating word frequency counting.
This text file has some words repeated.
"""
with open("sample_text_file.txt", "w") as f:
    f.write(file_content)

print("sample_text_file.txt generated successfully.")
```

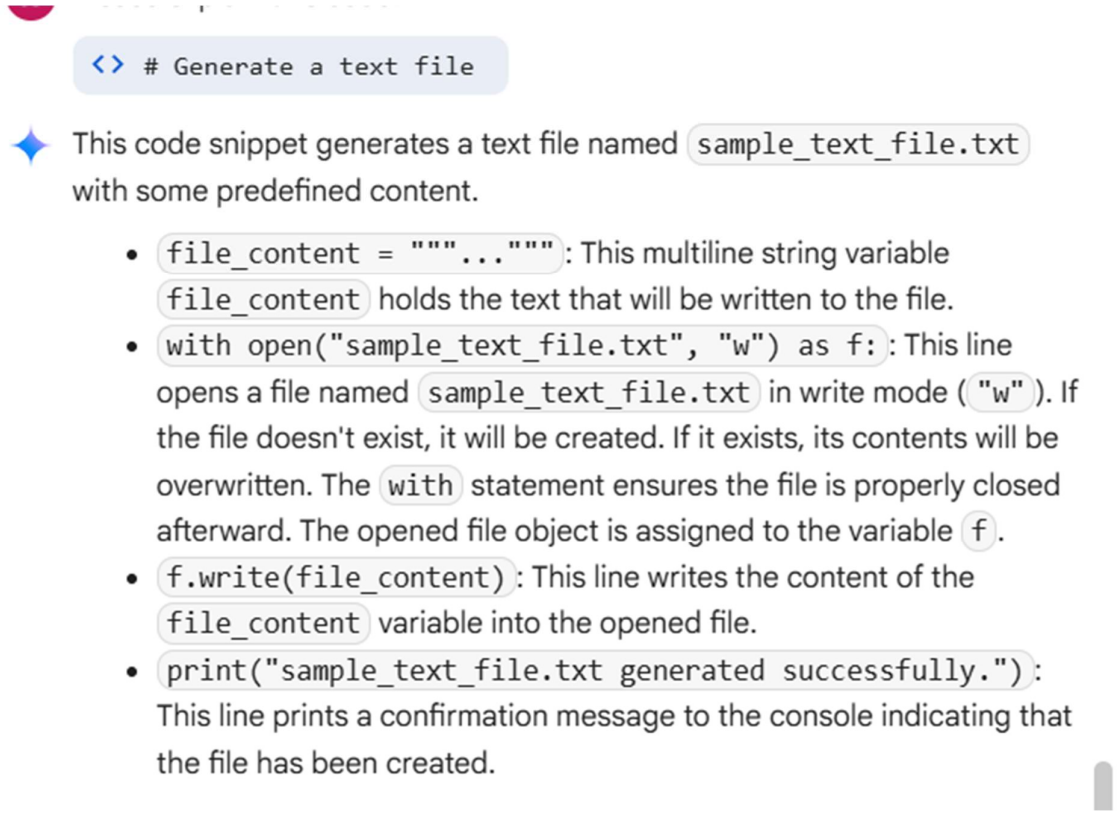
```
sample_text_file.txt generated successfully.
```

```
# Read the text file
with open("sample_text_file.txt", "r") as f:
    text = f.read()

print("Content of the file:")
print(text)
```

```
Content of the file:
This is a sample text file.
This file is for demonstrating word frequency counting.
This text file has some words repeated.
```

EXPLANATION 2:



#TASK DESCRIPTION 3:

Use Cursor AI to generate a Python class called Book with attributes title, author, and a method summary() that prints the details

PROMPT:

Develop a code cursor AI to generate python class called book with attributes title,author and method summary() that prints the details

EXPECTED OUTPUT 3:

Screenshot comparisons and student commentary on code clarity and performance

```python
class Book:
    def __init__(self, title, author):
        self.title = title
        self.author = author

    def summary(self):
        print(f"Title: {self.title}\nAuthor: {self.author}")

# Example usage:
# my_book = Book("The Hitchhiker's Guide to the Galaxy", "Douglas Adams")
# my_book.summary()
```

EXPLANATION 3:

This code defines a Python class called `Book`.

- **`class Book:`**: This line starts the definition of the class named `Book`.
- **`def __init__(self, title, author):`**: This is the constructor method. It's called when you create a new `Book` object. It takes `self` (which refers to the instance of the class), `title`, and `author` as arguments and initializes the `title` and `author` attributes of the object.
- **`self.title = title`**: This line assigns the value passed for `title` to the `title` attribute of the `Book` object.
- **`self.author = author`**: This line assigns the value passed for `author` to the `author` attribute of the `Book` object.
- **`def summary(self):`**: This defines a method named `summary` within the `Book` class. It takes `self` as an argument.
- **`print(f"Title: {self.title}\nAuthor: {self.author}")`**: This line inside the `summary` method prints the title and author of the book in a formatted string.

#TASK DESCRIPTION 4:

Ask Gemini to write a program that checks whether a number is an Armstrong number, and then modify it using Cursor AI to improve performance or structure

PROMPT:

Develop a code to generate program that checks whether a number is an Armstrong number, and then modify it using Cursor AI to improve performance or structure

EXPECTED OUTPUT 4:

Two versions of the code with screenshots, and a summary of what changes were made by Cursor

```python
def is_armstrong_number(number):
    """Checks if a number is an Armstrong number."""
    num_str = str(number)
    num_digits = len(num_str)
    armstrong_sum = 0
    for digit in num_str:
        armstrong_sum += int(digit) ** num_digits
    return armstrong_sum == number

# Example usage:
num_to_check = 153
if is_armstrong_number(num_to_check):
    print(f"{num_to_check} is an Armstrong number.")
else:
    print(f"{num_to_check} is not an Armstrong number.")

num_to_check = 123
if is_armstrong_number(num_to_check):
    print(f"{num_to_check} is an Armstrong number.")
else:
    print(f"{num_to_check} is not an Armstrong number.")
```

```
153 is an Armstrong number.
123 is not an Armstrong number.
```

EXPLANATION 4:

1. `def is_armstrong_number(number):` : This line defines the function `is_armstrong_number` that takes one argument, `number`.
2. `"""Checks if a number is an Armstrong number."""` : This is a docstring that explains what the function does.
3. `num_str = str(number)` : The input `number` is converted to a string so that each digit can be easily accessed.
4. `num_digits = len(num_str)` : The number of digits in the input number is calculated.
5. `armstrong_sum = 0` : A variable `armstrong_sum` is initialized to 0. This variable will store the sum of each digit raised to the power of the number of digits.
6. `for digit in num_str:` : This loop iterates through each character (digit) in the `num_str` string.
7. `armstrong_sum += int(digit) ** num_digits` : Inside the loop, each `digit` (which is a string character) is converted back to an integer using `int(digit)`. This integer is then raised to the power of `num_digits` using the `**` operator, and the result is added to `armstrong_sum`.
8. `return armstrong_sum == number` : After the loop finishes, the function checks if the calculated `armstrong_sum` is equal to the original `number`. If they are equal, the function returns `True`.

#TASK DESCRIPTION 5:

Use both Gemini and Cursor AI to generate code for sorting a list of dictionaries by a
specific key (e.g., age)

PROMPT:

Develop a code to generate a code Use both Gemini and Cursor AI to generate code for sorting a list of dictionaries by a specific key (e.g., age)

EXPECTED OUTPUT 5:

Screenshot comparisons and student commentary on code clarity and performance

```
list_of_dicts = [
    {'name': 'Alice', 'age': 30},
    {'name': 'Bob', 'age': 25},
    {'name': 'Charlie', 'age': 35}
]

sorted_list = sorted(list_of_dicts, key=lambda x: x['age'])

print(sorted_list)
```

```
[{'name': 'Bob', 'age': 25}, {'name': 'Alice', 'age': 30}, {'name': 'Charlie', 'age': 35}]
```

EXPLANATION OF CODE

key 'age'.

- **`list_of_dicts = [...]`**: This line initializes a list named `list_of_dicts` containing three dictionaries. Each dictionary represents a person with 'name' and 'age'.
- **`sorted_list = sorted(list_of_dicts, key=lambda x: x['age'])`**: This is the core of the sorting operation.
    - `sorted()` is a built-in Python function that returns a new sorted list from the items in an iterable.
    - `list_of_dicts` is the list that we want to sort.
    - `key=lambda x: x['age']` is the key function that determines the sorting order. The `lambda` function is a small anonymous function that takes one argument (`x`, which represents each dictionary in the list) and returns the value associated with the key 'age' (`x['age']`). The `sorted()` function uses these 'age' values to compare and sort the dictionaries.
- **`print(sorted_list)`**: This line prints the newly created `sorted_list` to the console. The list will be sorted in ascending order based on the 'age' values.