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AI Assisted Coding Assignment 9.2

Task 1: Function Summary Generation

Prompt: "Write a short, clear summary describing the purpose of each function in the script. Do not explain code implementation details."

```python
def add(x, y):
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Invalid input")
```

Output:

```python
def add(x, y):
    return x + y
"""The add function takes two arguments, x and y, and returns their sum.
The subtract function takes two arguments, x and y, and returns the result of subtracting y from x.
The multiply function takes two arguments, x and y, and returns their product."""
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Invalid input")
```

Explanation:

This prompt tells the AI to write only the **main purpose** of each function. Since it says not to explain the code steps, the AI gives **short and clear summaries**. It helps readers quickly understand what each function does.

Task 2: Logical Explanation for Conditions and Loops

Prompt Used: "Explain only the decision-making logic and loop behavior in the program. Skip basic syntax explanations within the code."

Code:

```python
def add(x, y):
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Invalid input")
```

Output:

```python
def add(x, y):
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
# Main loop: keep prompting until a valid operation is selected and processed
while True:
    # Read user's operation choice
    choice = input("Enter choice (1/2/3): ")
    # Validate: only proceed when choice is one of the allowed options
    if choice in ['1', '2', '3']:
        # Numbers are requested only after a valid choice (avoids unnecessary input)
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        # Dispatch to the proper operation based on the validated choice
        if choice == '1':
            # Addition branch
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            # Subtraction branch
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            # Multiplication branch
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        # Exit after performing one successful operation
        break
    else:
        # Invalid choice: inform user and re-loop (no break)
        print("Invalid input")
```

Explanation:

This prompt asks the AI to explain only the **logic behind decisions and loops**. So the AI describes **why a condition is checked** and **what a loop is doing**, instead of explaining Python syntax. This makes the program logic easier to understand.

Task 3: File-Level Overview

Prompt Used: "Write a brief overview summarizing the purpose and functionality of the entire Python file.within the code"

Code:

```python
def add(x, y):
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Invalid input")
```

Output:

```python
def add(x, y):
    """

    Calculator Module
    This module implements a simple command-line calculator that performs basic arithmetic operations.
    It provides functionality to add, subtract, and multiply two numbers based on user input.
    The program displays a menu of operations, prompts the user to select an operation (1-3),
    accepts two numeric inputs, performs the selected calculation, and displays the result.
    The program validates user input and re-prompts if an invalid choice is entered.
    Functions:
        add(x, y): Returns the sum of two numbers.
        subtract(x, y): Returns the difference of two numbers.
        multiply(x, y): Returns the product of two numbers.
    """

    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
```

Explanation:

This prompt tells the AI to describe the **whole file in general**. The AI summarizes the overall purpose of the program and what it does. This helps someone understand the file before reading the code.

Task 4: Refining Existing Documentation

Prompt: "Rewrite the existing comments to improve clarity and consistency without changing technical meaning."

Code:

```python
def add(x, y):
    """
    Calculator Module
    This module implements a simple command-line calculator that performs basic arithmetic operations.
    It provides functionality to add, subtract, and multiply two numbers based on user input.
    The program displays a menu of operations, prompts the user to select an operation (1-3),
    accepts two numeric inputs, performs the selected calculation, and displays the result.
    The program validates user input and re-prompts if an invalid choice is entered.
    Functions:
        add(x, y): Returns the sum of two numbers.
        subtract(x, y): Returns the difference of two numbers.
        multiply(x, y): Returns the product of two numbers.
    """
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
```

Output:

```python
def add(x, y):
    """Add two numbers and return the result."""
    return x + y
def subtract(x, y):
    """Subtract two numbers and return the result."""
    return x - y
def multiply(x, y):
    """Multiply two numbers and return the result."""
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Please try again.")
```

Explanation:

This prompt asks the AI to **improve old comments** without changing their meaning. The AI rewrites them in a **clearer and more professional way**. It works like editing, not changing the code logic.

Task 5: Prompt Detail Impact Study
Code:

```python
def add(x, y):
    return x + y
def subtract(x, y):
    return x - y
def multiply(x, y):
    return x * y
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Please try again.")
```

Prompt 1 : "Document this function."

Prompt 1 Output:

```python
def add(x, y):
    return x + y
"Document this function."
"""This function adds two numbers together."""
def subtract(x, y):
    return x - y
"""This function subtracts the second number from the first."""
def multiply(x, y):
    return x * y
"""This function multiplies two numbers together."""
print("Select operation:")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
while True:
    choice = input("Enter choice (1/2/3): ")
    if choice in ['1', '2', '3']:
        num1 = float(input("Enter first number: "))
        num2 = float(input("Enter second number: "))
        if choice == '1':
            print(f"{num1} + {num2} = {add(num1, num2)}")
        elif choice == '2':
            print(f"{num1} - {num2} = {subtract(num1, num2)}")
        elif choice == '3':
            print(f"{num1} * {num2} = {multiply(num1, num2)}")
        break
    else:
        print("Please try again.")
```

Prompt 2:" Write a clear and concise docstring for this function. Explain the function's purpose, describe each parameter with its meaning, and specify what the function returns. Do not describe internal calculations within the code."

Prompt 2 Output:

```python
def add(x, y):
    """
    Add two numbers together.
    Parameters:
        x: The first number to be added.
        y: The second number to be added.
    Returns:
        The sum of x and y.
    """

    return x + y
def subtract(x, y):
    """
    Subtract y from x.
    Parameters:
        x: The first number.
        y: The second number to be subtracted from x.
    Returns:
        The difference of x and y.
    """

    return x - y
def multiply(x, y):
    return x * y
    """
Multiply two numbers together.
Parameters:
    x: The first number to be multiplied.
    y: The second number to be multiplied.
    Returns:
    The product of x and y.
    """
print("Select operation:")
```

Output:

Criteria	Brief Prompt Output	Detailed Prompt Output	Observation
Completeness	Only mentions basic purpose	Includes purpose, parameters, and return value	Detailed prompt gives fuller documentation
Clarity	Very short	Clear and easy to understand	Detailed prompt improves clarity
Accuracy	Correct but minimal	Correct and informative	Both accurate, but detailed is more helpful
Readability	Less informative for new users	Easy for any developer to understand	Detailed prompt improves readability
Professional Quality	Too simple for real projects	Matches professional documentation standards	Prompt detail directly improves quality

Explanation:

Here I used two prompts: one short and one detailed.
The short prompt gave only a **basic description**.
The detailed prompt gave **full information about purpose, parameters, and return value**.

This shows that **better prompts produce better documentation**.