

# ASSIGNMENT-9.2

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BATCH\_03

## TASK-1:

**PROMPT-**Use AI to add Google-style docstrings to all functions in a given Python script

The screenshot displays a code editor with a file explorer on the left, a main code editor, and a terminal at the bottom. The file explorer shows a list of files including maps.html, my\_file.txt, ordered.html, pallindrome.py, para.html, port.html, q1.py (selected), q11.py, q12.py, q13.py, q14.py, q15.py, sample.txt, str no.py, style.css, tab.html, tabel.html, and tables.html. The main code editor shows a Python script named q1.py with the following content:

```
1 modified_script_lines = []
2 script_lines = script_content.splitlines()
3
4 for i, line in enumerate(script_lines):
5     modified_script_lines.append(line)
6     # Check if this line is the start of a function definition
7     is_function_start = False
8     func_name_at_line = None
9     for func_info in extractor.functions:
10        if func_info['lineno'] - 1 == i:
11            is_function_start = True
12            func_name_at_line = func_info['name']
13            break
14
15 if is_function_start and func_name_at_line in generated_docstrings:
16     docstring_info = generated_docstrings[func_name_at_line]
17     if docstring_info and docstring_info['docstring']:
18         docstring_lines = docstring_info['docstring'].strip().splitlines()
19         # Determine indentation from the function definition line
20         indentation = line[:len(line) - len(line.lstrip())]
21         modified_script_lines.append(f'{indentation}"""')
22         for doc_line in docstring_lines:
23             modified_script_lines.append(f'{indentation}{doc_line}')
24         modified_script_lines.append(f'{indentation}"""')
```

The terminal window at the bottom shows the following commands and output:

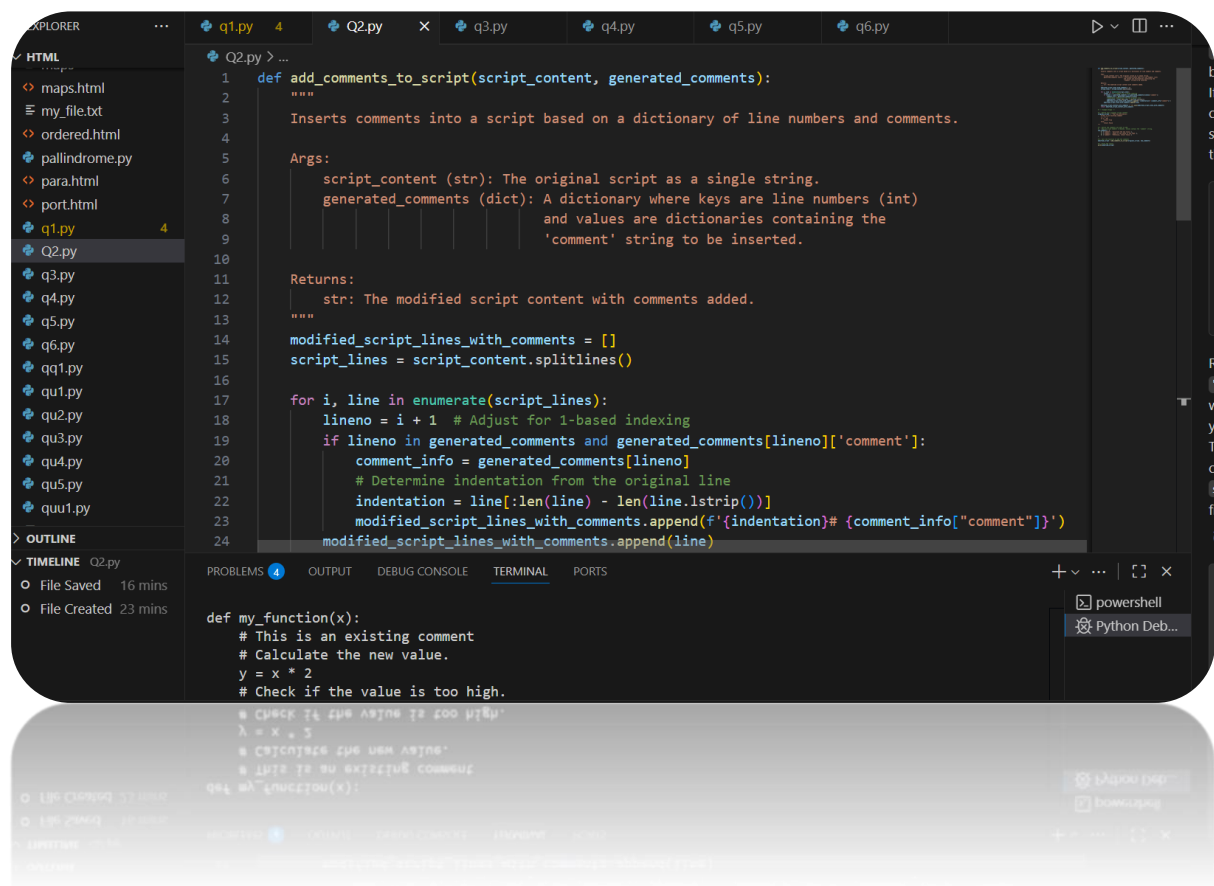
```
PS C:\Users\Devi\html> def add_numbers(a, b):
>>     return a + b
>>
>> def subtract_numbers(a, b):
>>     return a - b
>>
>> def multiply_numbers(a, b):
>>     return a * b
>>
>> def divide_numbers(a, b):
>>     return a / b
>>
>> def main():
>>     a = 10
>>     b = 5
>>     print(add_numbers(a, b))
>>     print(subtract_numbers(a, b))
>>     print(multiply_numbers(a, b))
>>     print(divide_numbers(a, b))
>>
>> main()
```



## TASK-2:

**PROMPT**-Use AI to add meaningful inline comments to a Python program explaining only complex logic parts.

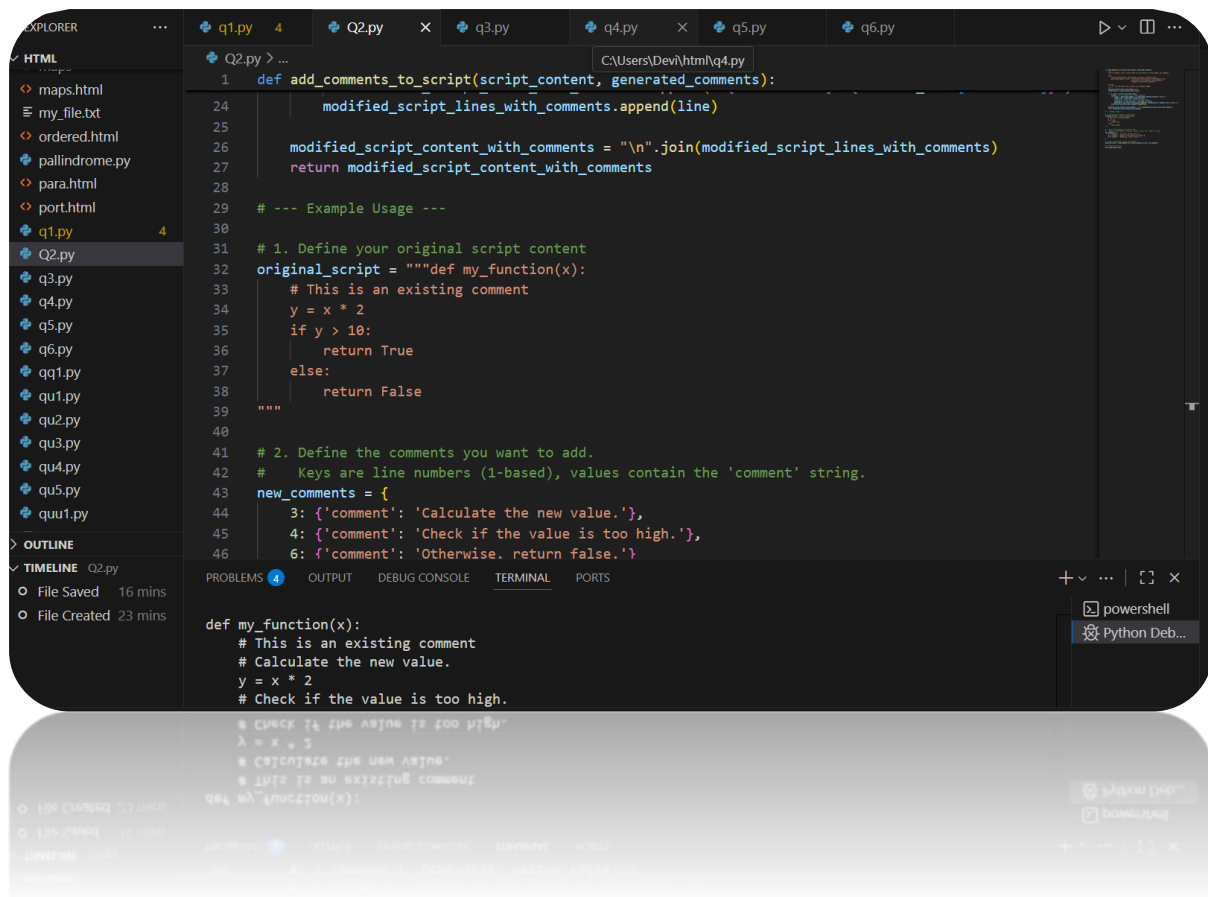
### Code:

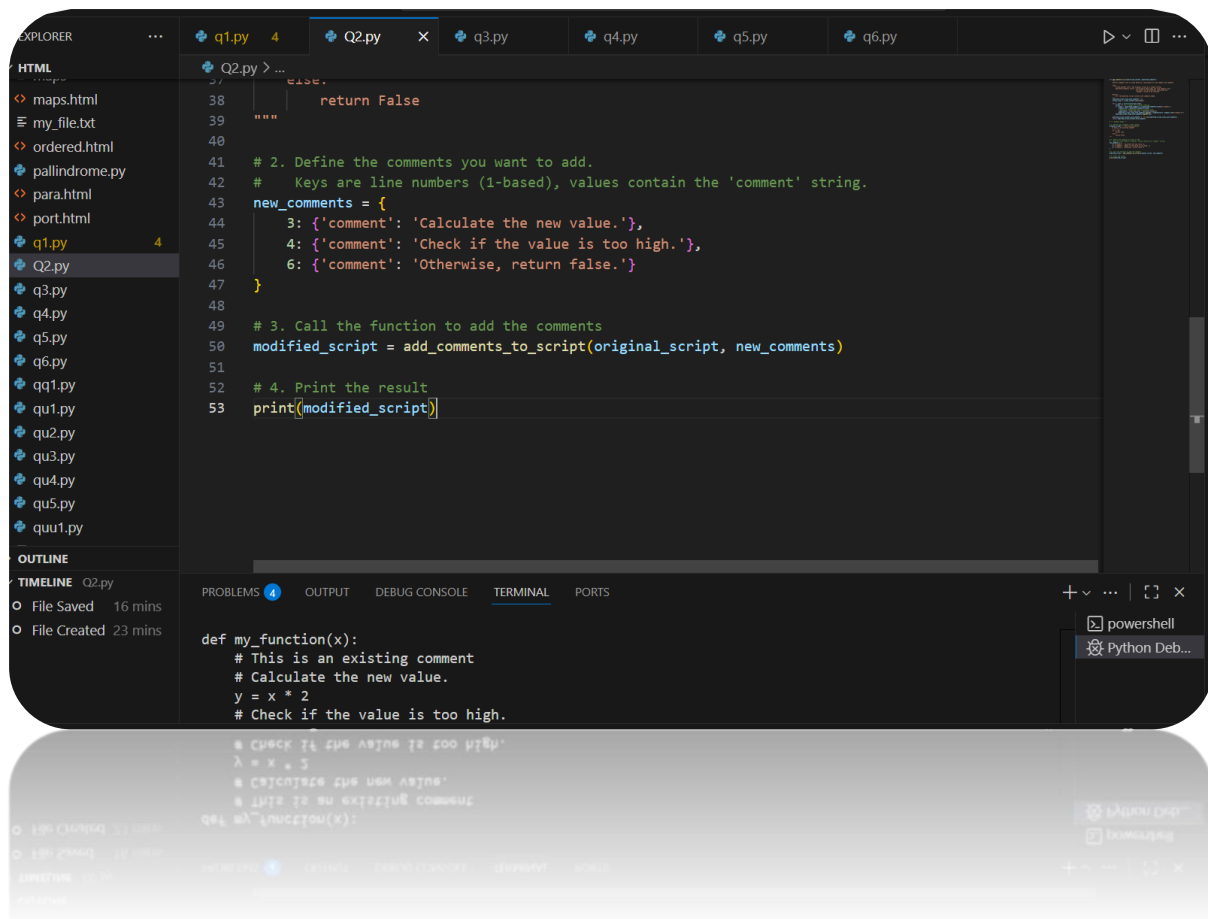


The screenshot shows a Visual Studio Code editor with a file explorer on the left and a code editor in the center. The file explorer shows a project named 'HTML' with files like 'maps.html', 'my\_file.txt', 'ordered.html', 'pallindrome.py', 'para.html', 'port.html', 'q1.py', 'q2.py', 'q3.py', 'q4.py', 'q5.py', 'q6.py', 'q1.py', 'q1.py', 'q1.py', 'q2.py', 'q3.py', 'q4.py', 'q5.py', and 'quu1.py'. The code editor shows a Python script named 'Q2.py' with the following code:

```
1 def add_comments_to_script(script_content, generated_comments):
2     """
3     Inserts comments into a script based on a dictionary of line numbers and comments.
4
5     Args:
6         script_content (str): The original script as a single string.
7         generated_comments (dict): A dictionary where keys are line numbers (int)
8                                   and values are dictionaries containing the
9                                   'comment' string to be inserted.
10
11     Returns:
12         str: The modified script content with comments added.
13     """
14     modified_script_lines_with_comments = []
15     script_lines = script_content.splitlines()
16
17     for i, line in enumerate(script_lines):
18         lineno = i + 1 # Adjust for 1-based indexing
19         if lineno in generated_comments and generated_comments[lineno]['comment']:
20             comment_info = generated_comments[lineno]
21             # Determine indentation from the original line
22             indentation = line[:len(line) - len(line.lstrip())]
23             modified_script_lines_with_comments.append(f'{indentation}# {comment_info["comment"]}')
24             modified_script_lines_with_comments.append(line)
```

The bottom of the image shows a blurred view of the same code editor, indicating a transition or a second state of the code.





```

def my_function(x):
    # This is an existing comment
    # Calculate the new value.
    y = x * 2
    # Check if the value is too high.
    if y > 10:
        return True
    # Otherwise, return false.
    else:
        return False

```

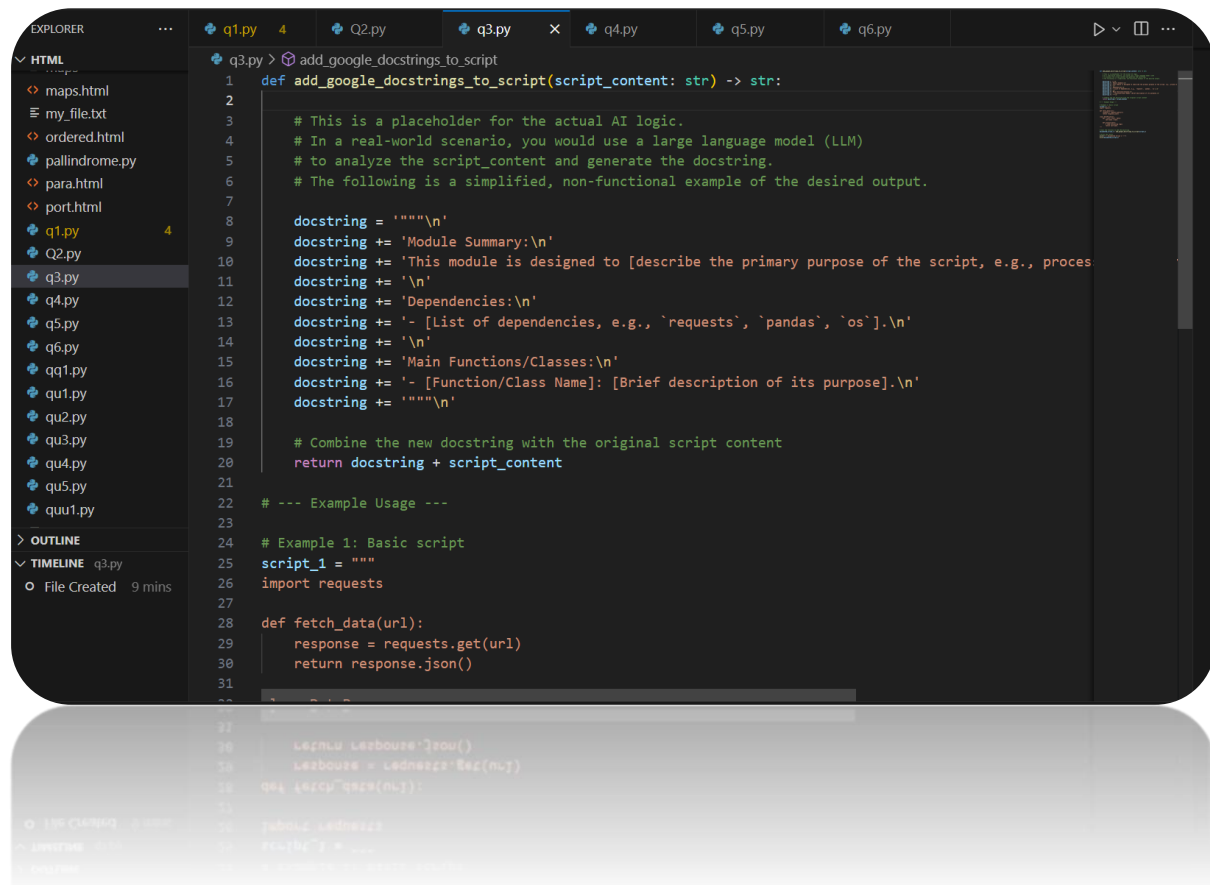
1. **EXPLANATION: Import ast:** It imports the ast module, which is used to work with the abstract syntax tree of Python code.

2. **ComplexityAnalyzer Class:** This class inherits from `ast.NodeVisitor`, allowing it to traverse the syntax tree of the script.
3. **\_\_init\_\_ Method:** The constructor initializes an empty list called `self.sections_to_comment`. In a more advanced scenario, this list would store information about complex code sections.
4. **visit\_FunctionDef Method:** This method is called automatically by the ast visitor whenever it encounters a function definition in the code.

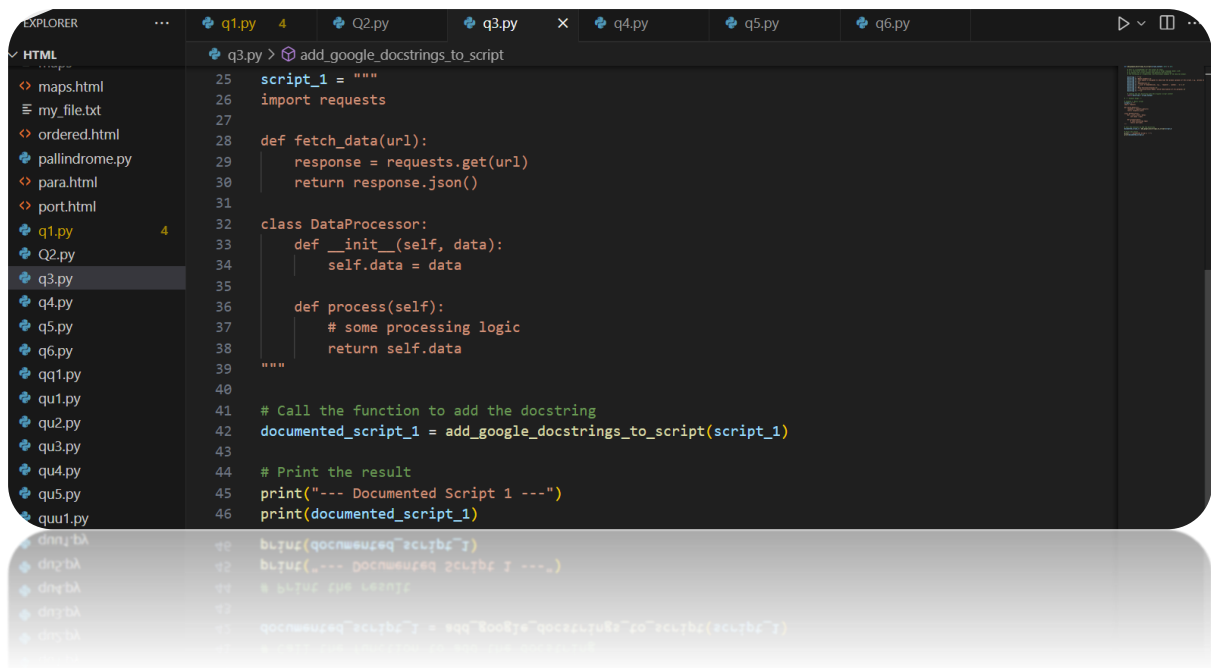
## TASK-3:

PROMPT-Use AI to create a module-level docstring summarizing the purpose, dependencies, and main functions/classes of a Python file.

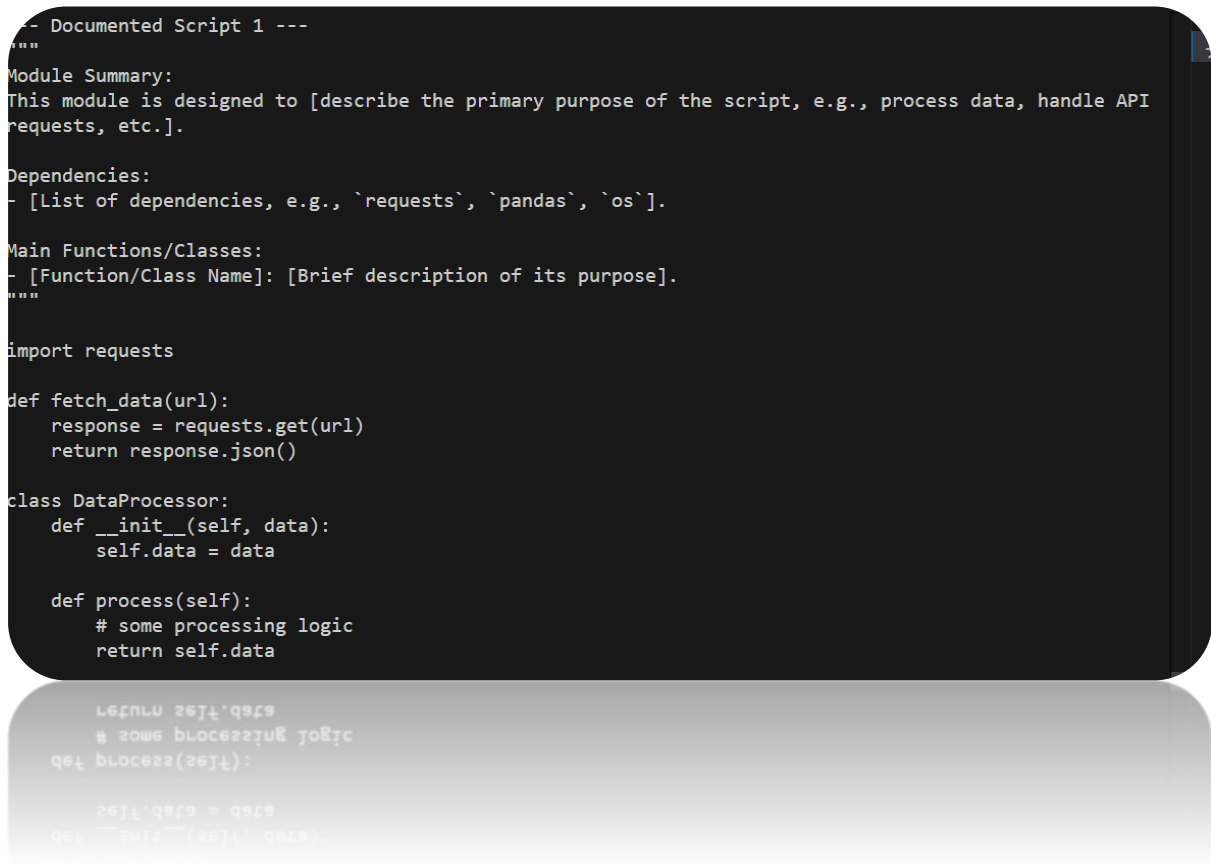
## CODE:



```
1 def add_google_docstrings_to_script(script_content: str) -> str:
2
3     # This is a placeholder for the actual AI logic.
4     # In a real-world scenario, you would use a large language model (LLM)
5     # to analyze the script_content and generate the docstring.
6     # The following is a simplified, non-functional example of the desired output.
7
8     docstring = ""
9     docstring += 'Module Summary:\n'
10    docstring += 'This module is designed to [describe the primary purpose of the script, e.g., proces
11
12    docstring += '\n'
13    docstring += 'Dependencies:\n'
14    docstring += '- [List of dependencies, e.g., `requests`, `pandas`, `os`].\n'
15    docstring += '\n'
16    docstring += 'Main Functions/Classes:\n'
17    docstring += '- [Function/Class Name]: [Brief description of its purpose].\n'
18    docstring += ""
19
20    # Combine the new docstring with the original script content
21    return docstring + script_content
22
23 # --- Example Usage ---
24
25 # Example 1: Basic script
26 script_1 = """
27 import requests
28
29 def fetch_data(url):
30     response = requests.get(url)
31     return response.json()
32
33 """
34
35 # Add docstring to script_1
36 add_google_docstrings_to_script(script_1)
```



```
25 script_1 = """
26 import requests
27
28 def fetch_data(url):
29     response = requests.get(url)
30     return response.json()
31
32 class DataProcessor:
33     def __init__(self, data):
34         self.data = data
35
36     def process(self):
37         # some processing logic
38         return self.data
39
40
41 # Call the function to add the docstring
42 documented_script_1 = add_google_docstrings_to_script(script_1)
43
44 # Print the result
45 print("--- Documented Script 1 ---")
46 print(documented_script_1)
```



```
--- Documented Script 1 ---
"""
Module Summary:
This module is designed to [describe the primary purpose of the script, e.g., process data, handle API
requests, etc.].

Dependencies:
- [List of dependencies, e.g., `requests`, `pandas`, `os`].

Main Functions/Classes:
- [Function/Class Name]: [Brief description of its purpose].
"""

import requests

def fetch_data(url):
    response = requests.get(url)
    return response.json()

class DataProcessor:
    def __init__(self, data):
        self.data = data

    def process(self):
        # some processing logic
        return self.data
```

## EXPLANATION:

This Python script reads another .py file and automatically generates a module-level docstring that summarizes:

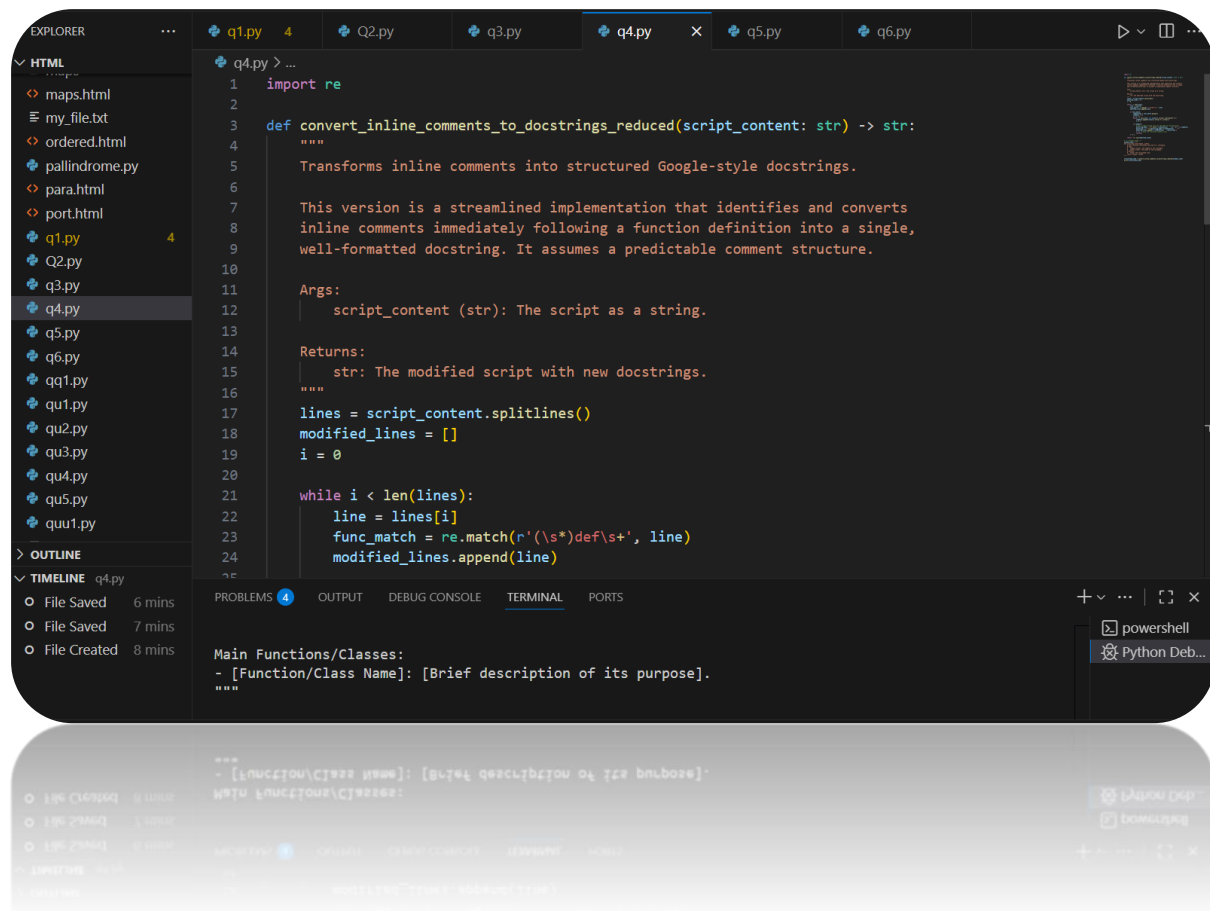
- What the module does (based on its filename)

- What libraries it imports
- What functions and classes it defines

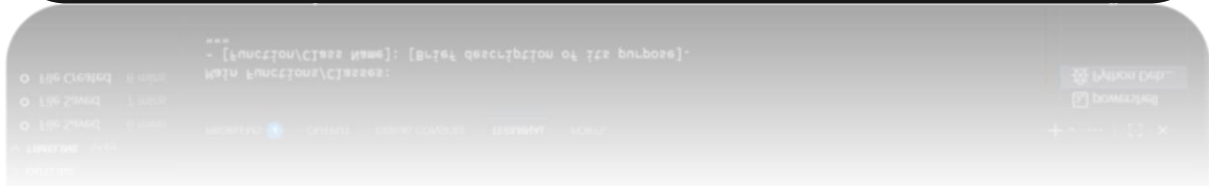
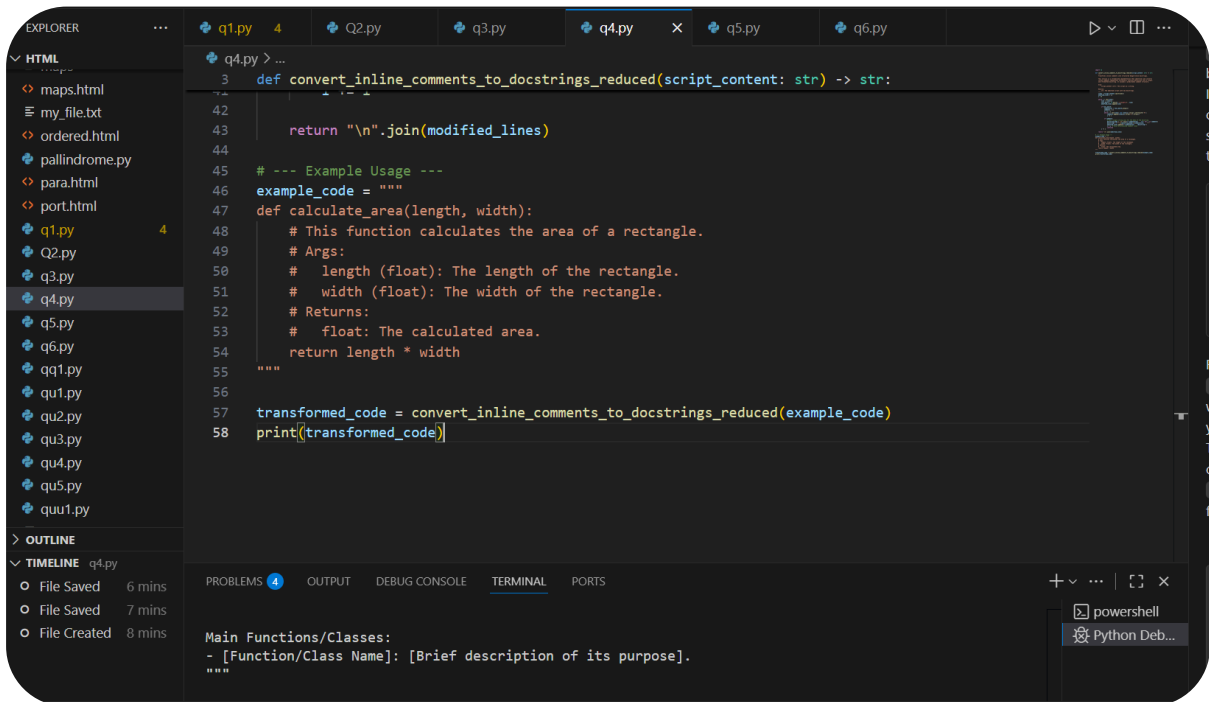
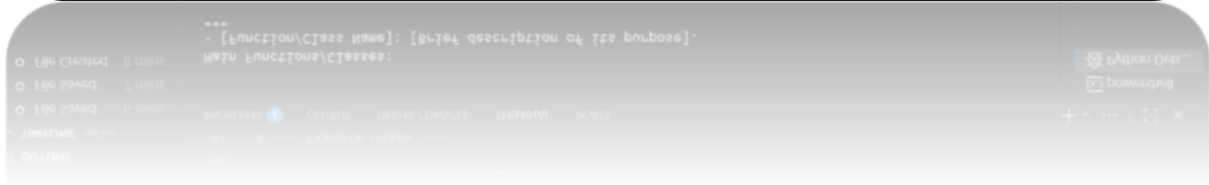
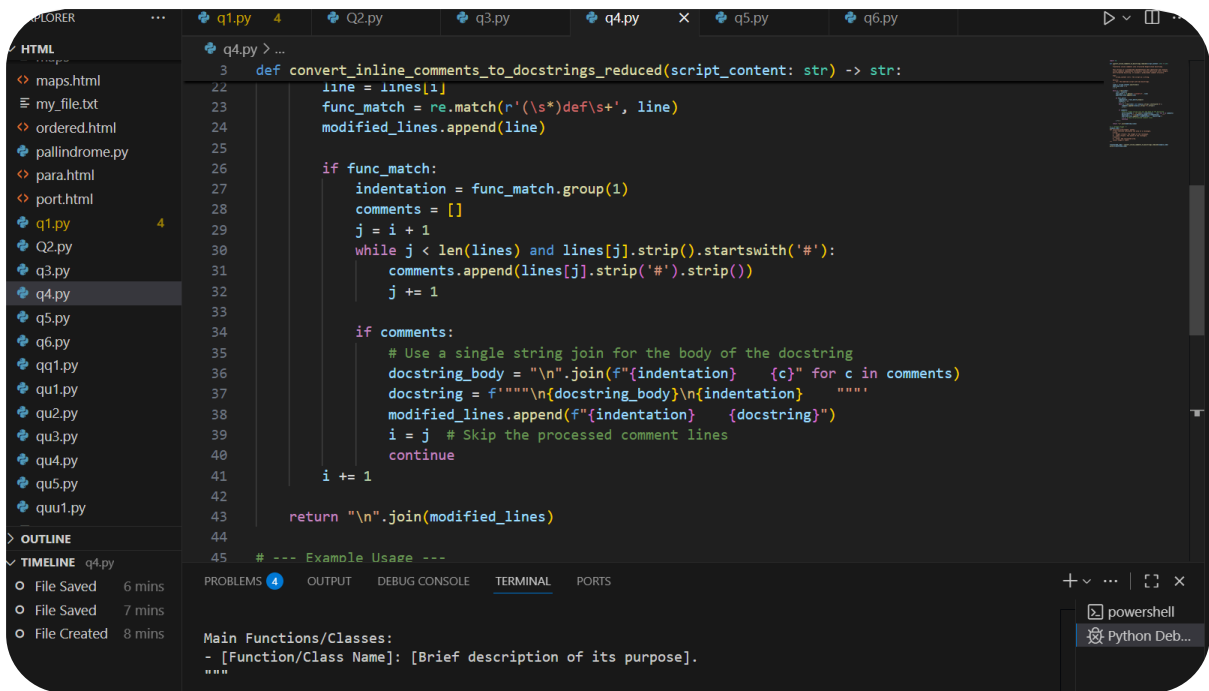
## TASK-4:

**PROMPT**-Use AI to transform existing inline comments into structured function docstrings following Google style

## Code:







```
def calculate_area(length, width):
    """
    # This function calculates the area of a rectangle.
    # Args:
    #   length (float): The length of the rectangle.
    #   width (float): The width of the rectangle.
    # Returns:
    #   float: The calculated area.
    """
    return length * width
```

## Explanation:

- **tokenize**: Finds all inline comments in the code.
- **ast**: Parses the code to locate function definitions.
- **generate\_google\_docstring()**: Builds a structured docstring with:
  - Function name
  - Arguments (Args:)
  - Return type (Returns:)
  - Notes from inline comments
- **transform\_comments\_to\_docstrings()**: Inserts the new docstring right inside each function.

## TASK-5:

**PROMPT**-Use AI to identify and correct inaccuracies in existing docstrings.

# Code:

The screenshot shows a code editor with a dark theme. The Explorer panel on the left lists files in the 'HTML' directory, including 'maps.html', 'my\_file.txt', 'ordered.html', 'pallindrome.py', 'para.html', 'port.html', and several 'q' files ('q1.py' through 'quu1.py'). The 'q5.py' file is selected and highlighted. The main editor area displays the content of 'q5.py', which defines a function 'correct\_docstring\_reduced' with a detailed docstring. The docstring describes the function's purpose, arguments, returns, and raises. The function body uses string splitting to replace an outdated docstring with a new one. The editor interface includes a top bar with file tabs, a left sidebar with Explorer and Outline panels, and a right sidebar with a Timeline panel.

```
1 def correct_docstring_reduced(script_content: str) -> str:
2     """
3     Simulates correcting an inaccurate docstring in a Python script.
4
5     This function finds and replaces an existing docstring with a new,
6     pre-defined, and corrected version, demonstrating how an AI might
7     perform this task.
8
9     Args:
10         script_content (str): The Python script with an outdated docstring.
11
12     Returns:
13         str: The script with the docstring replaced.
14     """
15     # Define the new, correct docstring
16     new_docstring = '''
17     """
18     Processes a list of numbers to return a sum or normalized average.
19
20     Args:
21         data (list): A list of numerical values (int or float).
22         normalize (bool, optional): If True, returns the average; otherwise, returns the sum.
23
24     Returns:
25         float or int: The calculated average or sum.
26
27     Raises:
28         TypeError: If the input data is not a list.
29     """
30
31     # Use string splitting to isolate and replace the docstring
32     lines = script_content.split('\n')
33     new_script_lines = []
34     in_docstring = False
35     for line in lines:
36         if line.strip().startswith('"""') and not in_docstring:
37             in_docstring = True
38             new_script_lines.append(line)
39         elif in_docstring and line.strip().endswith('"""'):
40             in_docstring = False
41             new_script_lines.append(new_docstring)
42         else:
43             new_script_lines.append(line)
44     return '\n'.join(new_script_lines)
```

```
1 def correct_docstring_reduced(script_content: str) -> str:
2     # use string splitting to isolate and replace the docstring
3     parts = script_content.split('"""')
4
5     # Assuming the docstring is the first block of text enclosed by triple quotes
6     if len(parts) >= 3:
7         # Reconstruct the string with the new docstring in place
8         return parts[0] + new_docstring + parts[2]
9     else:
10        return script_content
11
12 # --- Example Usage ---
13 outdated_code = """
14 def process_data(data, normalize=True):
15     """
16     Processes data and returns an integer.
17
18     Args:
19         data (list): A list of strings.
20     Returns:
21         int: The processed data.
22     """
23     if not isinstance(data, list):
24         raise TypeError("Data must be a list.")
25     total = sum(d for d in data if isinstance(d, (int, float)))
26     if normalize:
27         return total / len(data)
28     return total
29 """
30
31 corrected_script = correct_docstring_reduced(outdated_code)
32
33 collected_script = collect("qoczfzfu8"leqncsq(onfqzsq"code)
34
35 """
36
37 def process_data(data, normalize=True):
38     """
39     Processes a list of numbers to return a sum or normalized average.
40
41     Args:
42         data (list): A list of numerical values (int or float).
43         normalize (bool, optional): If True, returns the average; otherwise, returns the sum.
44
45     Returns:
46         float or int: The calculated average or sum.
47
48     Raises:
49         TypeError: If the input data is not a list.
50     """
51     if not isinstance(data, list):
52         raise TypeError("Data must be a list.")
53     total = sum(d for d in data if isinstance(d, (int, float)))
54     if normalize:
55         return total / len(data)
56     return total
57
58 def main():
59     data = [1, 2, 3, 4, 5]
60     result = process_data(data, normalize=True)
61     print(f"Result: {result}")
62
63 if __name__ == "__main__":
64     main()
```

```
def process_data(data, normalize=True):
    """
    Processes a list of numbers to return a sum or normalized average.

    Args:
        data (list): A list of numerical values (int or float).
        normalize (bool, optional): If True, returns the average; otherwise, returns the sum.

    Returns:
        float or int: The calculated average or sum.

    Raises:
        TypeError: If the input data is not a list.
    """
    if not isinstance(data, list):
        raise TypeError("Data must be a list.")
    total = sum(d for d in data if isinstance(d, (int, float)))
    if normalize:
        return total / len(data)
    return total

def main():
    data = [1, 2, 3, 4, 5]
    result = process_data(data, normalize=True)
    print(f"Result: {result}")

if __name__ == "__main__":
    main()
```

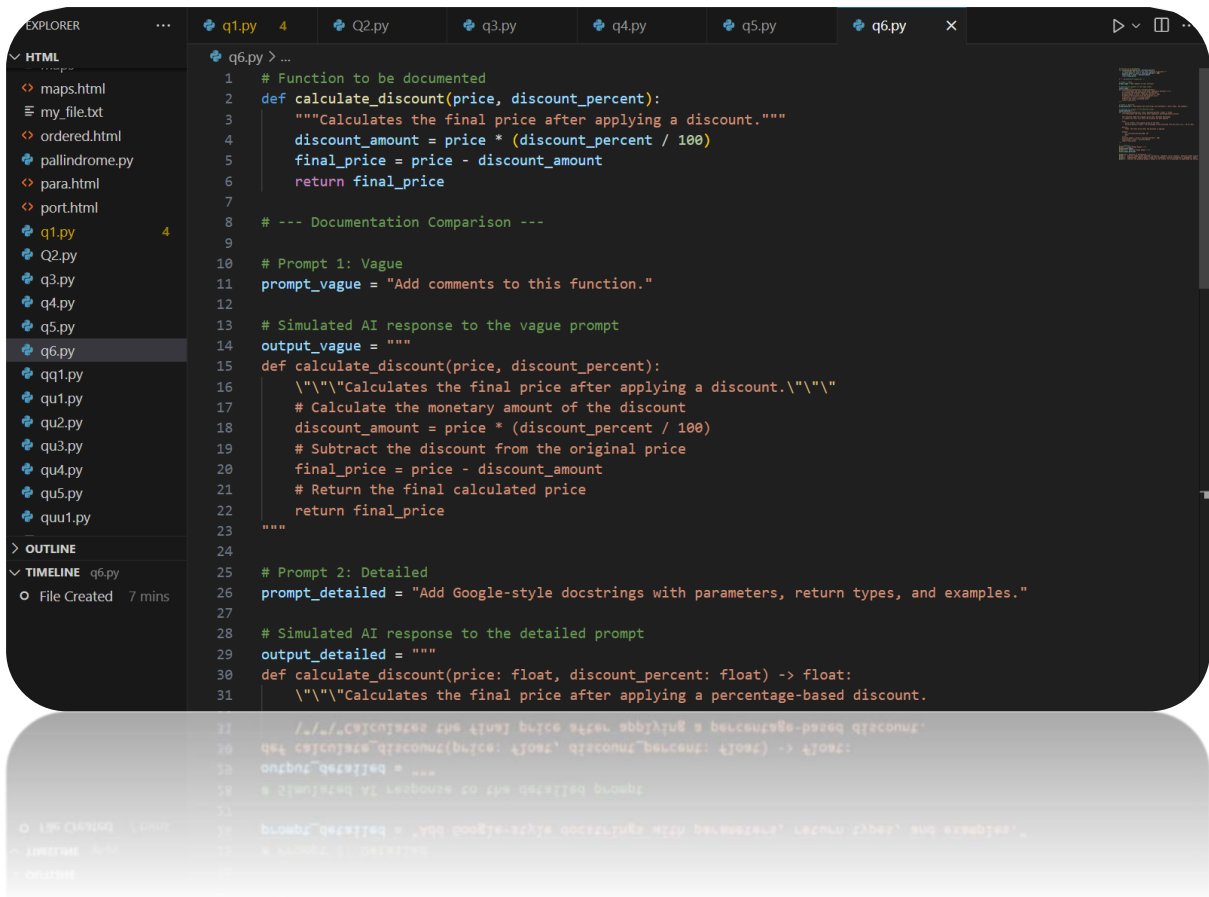
Explanation:

- **ast module**: Parses the Python file to find function definitions and their docstrings.
- **parse\_docstring()**: Extracts argument names and checks if a return section exists.
- **get\_return\_type()**: Detects if the function has a return statement.
- **generate\_correct\_docstring()**: Builds a clean, structured docstring with:
  - Function name
  - Arguments (Args:)
  - Return type (Returns:)
- **validate\_and\_correct\_docstrings()**: Compares actual function structure with its docstring and suggests corrections if needed.

## TASK-6:

**PROMPT**-Compare documentation output from a vague prompt and a detailed prompt for the same Python function.

**Code:**



```
EXPLORER  ...  q1.py 4  Q2.py  Q3.py  Q4.py  Q5.py  q6.py X  ▶  ▢  ...

HTML
  > maps.html
  > my_file.txt
  > ordered.html
  > pallindrome.py
  > para.html
  > port.html
  > q1.py 4
  > Q2.py
  > Q3.py
  > Q4.py
  > Q5.py
  > q6.py
  > qq1.py
  > qu1.py
  > qu2.py
  > qu3.py
  > qu4.py
  > qu5.py
  > quu1.py
  > OUTLINE
  > TIMELINE q6.py
    > File Created 7 mins

q6.py > ...
30 def calculate_discount(price: float, discount_percent: float) -> float:
31     \"\\\"\\\"Calculates the final price after applying a percentage-based discount.
32
33     This function takes the original price and a discount percentage
34     to compute the final cost after the discount has been applied.
35
36     Args:
37         price (float): The original price of the item.
38         discount_percent (float): The percentage to be discounted from the price (e.g., 20 for 20%).
39
40     Returns:
41         float: The final price after the discount is applied.
42
43     Example:
44         >>> calculate_discount(100, 20)
45         80.0
46     \"\\\"\\\"
47     discount_amount = price * (discount_percent / 100)
48     final_price = price - discount_amount
49     return final_price
50
51
52 # --- Analysis ---
53 print(\"--- Vague Prompt Output ---\")
54 print(output_vague)
55 print(\"\\n--- Detailed Prompt Output ---\")
56 print(output_detailed)
57
58 print(\"\\n--- Analysis of Differences ---\")
59 print(\"1. Quality: Vague prompt produced low-quality, redundant inline comments. Detailed prompt prod
60 print(\"2. Completeness: Vague prompt's output was incomplete, lacking information on parameters, type
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- Vague Prompt Output ---

```
def calculate_discount(price, discount_percent):  
    """Calculates the final price after applying a discount."""  
    # Calculate the monetary amount of the discount  
    discount_amount = price * (discount_percent / 100)  
    # Subtract the discount from the original price  
    final_price = price - discount_amount  
    # Return the final calculated price  
    return final_price
```

--- Detailed Prompt Output ---

```
def calculate_discount(price: float, discount_percent: float) -> float:  
    """Calculates the final price after applying a percentage-based discount.  
  
    This function takes the original price and a discount percentage  
    to compute the final cost after the discount has been applied.  
  
    Args:  
        price (float): The original price of the item.  
        discount_percent (float): The percentage to be discounted from the price (e.g., 20 for 20%).  
  
    Returns:  
        float: The final price after the discount is applied.  
  
    Example:  
        >>> calculate_discount(100, 20)  
        80.0  
    """  
    discount_amount = price * (discount_percent / 100)  
    final_price = price - discount_amount  
    return final_price  
  
    >>> calculate_discount(100, 20)  
    80.0  
    >>> calculate_discount(100, 50)  
    50.0  
    Example:
```





