AI Assisted Coding

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BATCH:04

ASSIGNMENT:13.2

TASK 1:

Task: Provide AI with the following redundant code and ask it to refactor

Python Code def
calculate_area(shape, x, y=0):
if shape == "rectangle":
return x * y elif shape
== "square": return x *
x elif shape ==
"circle": return 3.14 * x
* x

PROMPT:

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return x * y elif shape
== "square": return x *
x elif shape ==
"circle": return 3.14 * x
* x CODE& OUTPUT:

```python
import math

def calculate_area(shape, x, y=0):
    shape = shape.lower()
    area_functions = {
        "rectangle": lambda x, y: x * y,
        "square": lambda x, _: x * x,
        "circle": lambda x, _: math.pi * x * x,
    }

    if shape not in area_functions:
        raise ValueError("Unsupported shape")

    return area_functions[shape](x, y)

# Example calls with output
print("Rectangle area:", calculate_area("rectangle", 5, 3))
print("Square area:", calculate_area("square", 4))
print("Circle area:", calculate_area("circle", 7))

```

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code> & "C:\Users\
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI_7_9.py"
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code> & "C:\Users\
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI_7_9.py"
Rectangle area: 15
Square area: 16
Circle area: 153.93804002589985
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code>
```

1.Function Definition: Defines a function calculate_area that takes the shape name and dimensions as input.
2.Shape Handling: Converts the shape name to lowercase and defines a dictionary of lambda functions for calculating areas of different shapes.
3.Area Calculation: If the shape is supported, it retrieves the corresponding lambda function and calculates the area using the provided dimensions.
4.Error Handling: If the shape is not supported, it raises a ValueError.
5.Example Usage: Calls the function with different shapes and dimensions, printing the calculated areas.

TASK2: Legacy function without proper error handling Python Code

```
def read_file(filename):
f = open(filename, "r")
data = f.read() .close()
return data
```

PROMPT:
Legacy function without proper error handling
Python Code

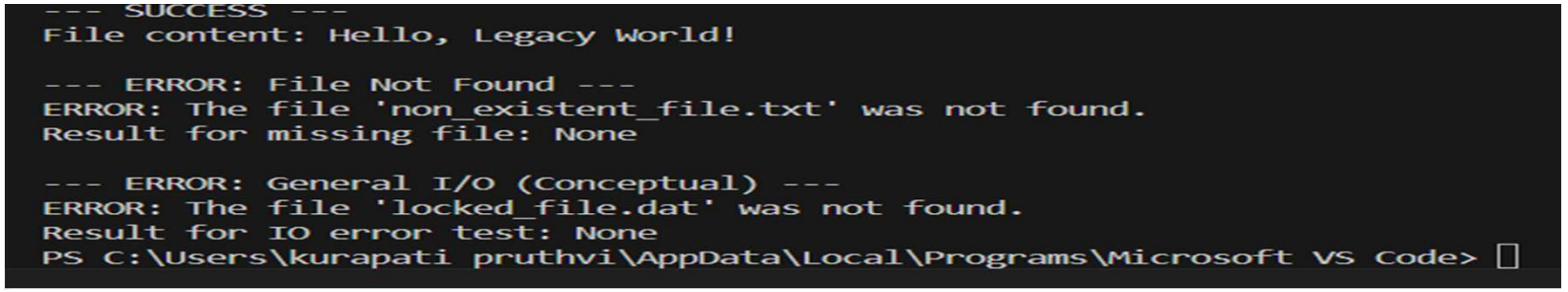
```
def read_file(filename):
f = open(filename, "r")
data = f.read() .close()
return data
```

CODE AND OUTPUT:

C: > Users > kurapati pruthvi > OneDrive > Documents > AI_7_2.py > ...

```python
def read_file_safe(filename):
    try:
        # The 'with' statement handles opening and automatically closing the file
        with open(filename, "r") as f:
            data = f.read()
        return data
    except FileNotFoundError:
        # Handle the case where the file does not exist
        print(f"ERROR: The file '{filename}' was not found.")
        return None  # Return None or raise a custom exception
    except IOError as e:
        # Handle general I/O errors (e.g., permission issues, reading errors)
        print(f"ERROR: An I/O error occurred while reading '{filename}': {e}")
        return None
# 1. Success case
# Create a dummy file for testing
with open("test_file.txt", "w") as f:
    f.write("Hello, Legacy World!")
content = read_file_safe("test_file.txt")
if content is not None:
    print(f"\n--- SUCCESS ---")
    print(f"File content: {content}")
# 2. File not found case
print("\n--- ERROR: File Not Found ---")
content_missing = read_file_safe("non_existent_file.txt")
print(f"Result for missing file: {content_missing}")
# 3. Handling potential permission issues (conceptual example)
# In a real-world scenario, you might get an IOError if you try
# to read a file without the necessary permissions.
print("\n--- ERROR: General I/O (Conceptual) ---")
# If 'locked_file.dat' existed but had restricted permissions
# the function would print the I/O error message.
content_io_error = read_file_safe("locked_file.dat")
print(f"Result for IO error test: {content_io_error}")
import os
os.remove("test_file.txt")
```

OUTPUT:



OBSERVATION:

1.read_file_safe: Defines a function to safely read files, handling errors.
2.Success: Creates, writes to, and reads "test_file.txt", printing the content.
3.File Not Found: Attempts to read "non_existent_file.txt", printing an error.
4.IOError (Conceptual): Attempts to read "locked_file.dat", demonstrating potential I/O error handling. 5.Cleanup: Deletes "test_file.txt"

Task3:Provide this legacy class to AI for readability and modularity improvements: Python Code class Student: def __init__(self, n, a, m1, m2, m3): self.n = n self.a = a self.m1 = m1 self.m2 = m2 self.m3 = m3
def details(self):

print("Name:", self.n, "Age:", self.a)
def total(self):
return self.m1+self.m2+self.m3 comprehension

PROMPT: Provide this legacy class to AI for readability and modularity improvements: Python Code class Student:
def __init__(self, n, a, m1, m2, m3):
self.n = n self.a
= a self.m1 = m1
self.m2 = m2
self.m3 = m3 def
details(self):
print("Name:", self.n, "Age:", self.a)
def total(self):
return self.m1+self.m2+self.m3

CODE &OUTPUT:

C: > Users > kurapati pruthvi > OneDrive > Documents > AI_7.3.py > Student > get_average

```python
class Student:
    def __init__(self, name: str, age: int, marks: list[int]):
        self.name = name
        self.age = age
        self.marks = marks  # A list of marks (e.g., [85, 90, 92])
    def get_details(self) -> str:
        return f"Name: {self.name}, Age: {self.age}"
    def get_total_marks(self) -> int:
        return sum(self.marks)
    def get_average(self) -> float:
        return sum(self.marks) / len(self.marks)
    def __str__(self) -> str:
        return self.get_details()
# ✅ Example usage
if __name__ == "__main__":
    # Create a student object with name, age, and list of 3 marks
    student1 = Student("Alice", 17, [85, 90, 92])

    # Display student details and calculated information
    print(student1.get_details())
    print("Total Marks:", student1.get_total_marks())
    print("Average Marks:", student1.get_average())

```

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code> & "C:\User
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI_7.3.py
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code> & "C:\User
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI_7.3.py
Name: Alice, Age: 17
Total Marks: 267
Average Marks: 89.0
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code> & "C:\User
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI_7.3.py
Name: Alice, Age: 17
Total Marks: 267
Average Marks: 89.0
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code>
```

OBSERVATION: 1student data..Class Definition: Defines a Student class to represent

1. __init__ (Constructor): Initializes a Student object with a
name (string), age (integer), and marks (list of integers).
2.get_details Method: Returns a formatted string containing the student's name and age.
3.get_total_marks Method: Calculates and returns the sum of the student's marks.
4.get_average Method: Calculates and returns the average of the student's marks.
5.Example Usage: Creates a Student object, then calls the methods to display the student's details, total marks, and average marks.
6.Class Definition: Defines a Student class to represent student data.
7.Class Definition: Defines a Student class to represent student data.

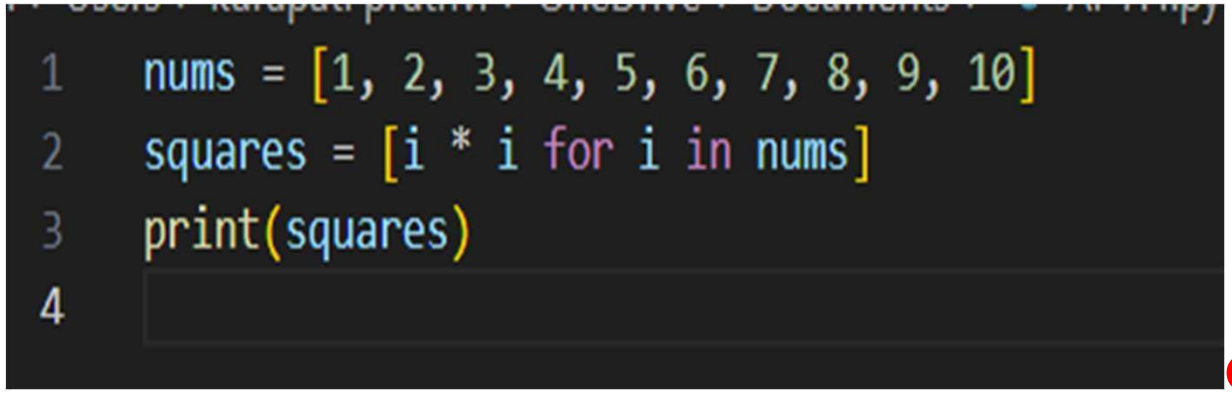
Task4: Refactor this inefficient loop with AI help

Python Code nums = [1,2,3,4,5,6,7,8,9,10] squares = []
for i in nums:
squares.append(i * i)

PROMPT:

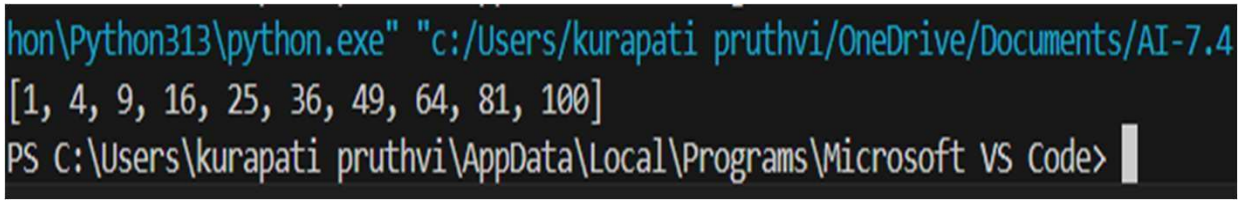
Task: Refactor this inefficient loop with AI help
Python Code nums = [1,2,3,4,5,6,7,8,9,10] squares = [] for i in nums:
squares.append(i * i)
Expected Output: AI suggested a list comprehension

CODE:



```
1  nums = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
2  squares = [i * i for i in nums]
3  print(squares)
4
```

OUTPUT:



```
hon\Python313\python.exe" "c:/Users/kurapati pruthvi/OneDrive/Documents/AI-7.4
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
PS C:\Users\kurapati pruthvi\AppData\Local\Programs\Microsoft VS Code>
```

OBSERVATION:

1.nums = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]: Creates a list named nums containing the integers from 1 to 10.
2.squares = [i * i for i in nums]: This is a list comprehension. It creates a new list called squares.
3.for i in nums: The list comprehension iterates through each element i in the nums list.
4.i * i: For each element i, it calculates the square of i (i.e., i multiplied by itself).
5.List Creation: The results of these calculations are collected into a new list called squares.
6.print(squares): Prints the squares list to the console. The output will be [1, 4, 9, 16, 25, 36, 49, 64, 81, 100].