AI-Ass-10.1

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Batch:05

Task: Description #1 – Syntax and Logic Errors. To identify and fix syntax and logic errors in a faulty

Python script.

Sample Input Code:

Calculate average score of a student

def calc_average(marks):

total = 0

for m in marks:

total += m

average = total / len(marks)

return avrage # Typo here

marks = [85, 90, 78, 92]

print("Average Score is ", calc_average(marks)

Expected Output:

• Corrected and runnable Python code with explanations of the

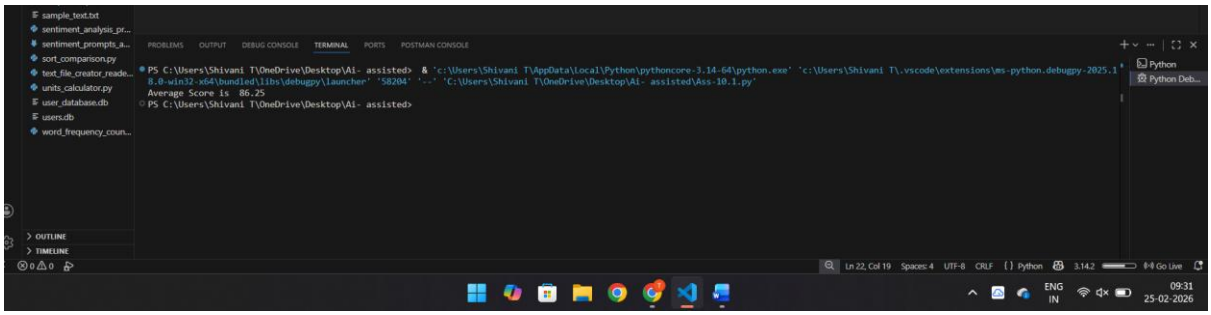
fixes.

Code:

```
def calc_average(marks):
    total = 0
    for m in marks:
        total += m
    average = total / len(marks)
    return average


marks = [85, 90, 78, 92]
```

print("Average Score is ", calc_average(marks))



Explanation: The original code had a typo in the return statement

(avrageinstead of average).

The print statement was missing a closing parenthesis**.**

Task: Description #2 – PEP 8 Compliance to refactor Python code to follow PEP 8 style guidelines.

Sample Input Code:

def area_of_rect(L,B) : return L*B

print(area_of_rect(10,20))

Expected Output:

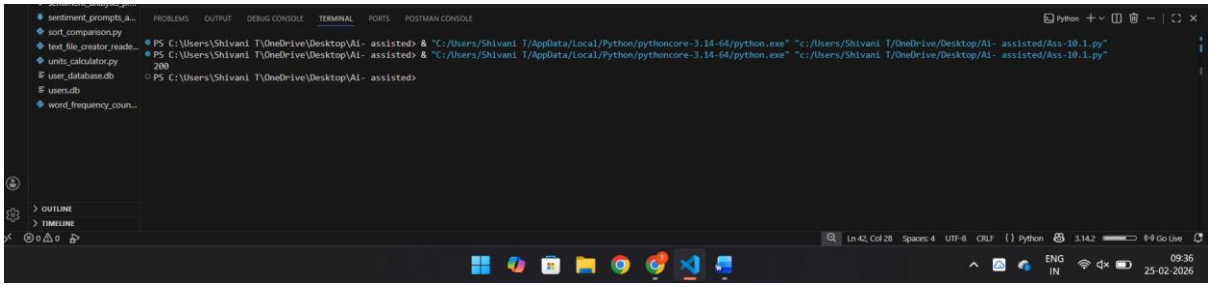
• Well-formatted PEP 8-compliant Python code.

Code: def area_of_rect(length, breadth):

    return length * breadth

#example usage

print(area_of_rect(10, 20))



Explanation: The original code had several PEP 8 compliance issues:

1. No spaces around the `=` operator in function definition.

2. No spaces around the `*` operator in the return statement.

3. No blank lines between function definition and usage.

4. No proper indentation in comments.

Task: Description #3 – Readability Enhancement to make code more readable without changing its

logic.

Sample Input Code:

```
def c(x,y):
return x*y/100
a=200
b=15
print(c(a,b))
```

Expected Output:

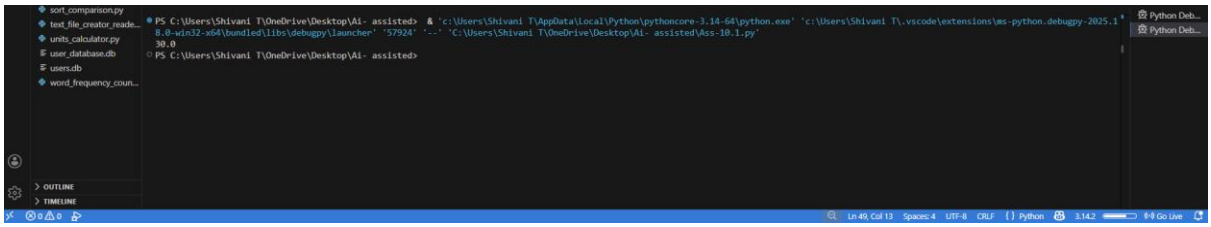
• Python code with descriptive variable names, inline

comments, and clear formatting.

Code:

```
def calculate_simple_interest(principal, rate):
    return principal * rate / 100


principal_amount = 200
interest_rate = 15
print(calculate_simple_interest(principal_amount, interest_rate))
```



Explanation: The original code had non-descriptive variable names (c, x, y, a, b).

The refactored code uses descriptive variable names (calculate_simple_interest, principal, rate, principal_amount, interest_rate) and includes an inline comment for clarity.

Task: Description #4 – Refactoring for Maintainability to break repetitive or long code into reusable

functions.

Sample Input Code:

students = ["Alice", "Bob", "Charlie"]

print("Welcome", students[0])

print("Welcome", students[1])

print("Welcome", students[2])

Expected Output:

• Modular code with reusable functions.

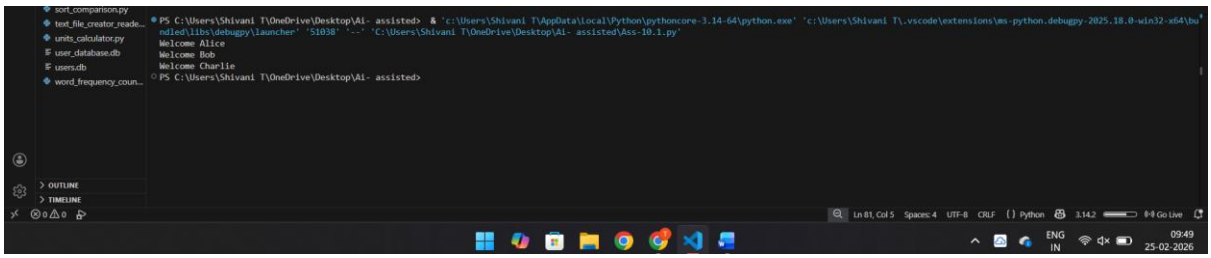
Code: def welcome_student(student_name):

    print("Welcome", student_name)

students = ["Alice", "Bob", "Charlie"]

for student in students:

    welcome_student(student)



Explanation: The original code had repetitive print statements for each student.

By creating a function welcome_student, we can reuse it for each student in the list, making the code more maintainable and cleaner.

Task: Description #5 – Performance Optimization. to make the code run faster.

Sample Input Code:

Find squares of numbers

nums = [i for i in range(1,1000000)]

squares = []

for n in nums:

squares.append(n**2)

print(len(squares))

Expected Output:

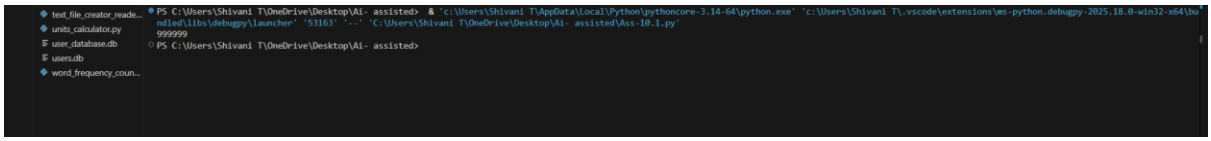
• Optimized code using list comprehensions or vectorized

operations.

Code: nums = [i for i in range(1, 1000000)]

squares = [n**2 for n in nums]

print(len(squares))



Explanation: The original code used a for loop to append squares to a list, which is less efficient.

The refactored code uses a list comprehension, which is more concise and faster for creating lists.

Task: Description #6 – Complexity Reduction.to simplify overly complex logic.

Sample Input Code:

def grade(score):

if score >= 90:

return "A"

else:

if score >= 80:

return "B"

else:

if score >= 70:

return "C"

else:

if score >= 60:

return "D"

else:

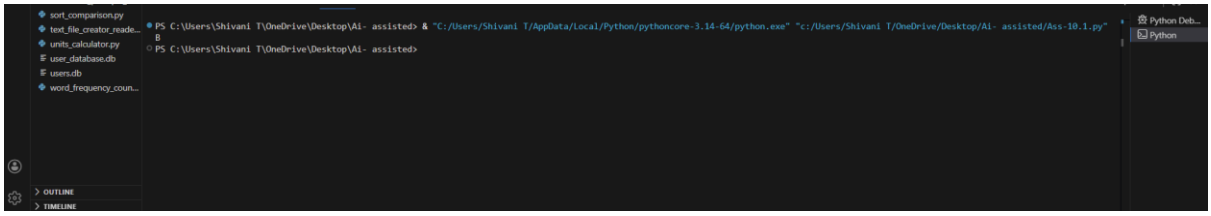
return "F"

Expected Output:

• Cleaner logic using elif or dictionary mapping.

Code: def grade(score):

```
    if score >= 90:
        return "A"
    elif score >= 80:
        return "B"
    elif score >= 70:
        return "C"
    elif score >= 60:
        return "D"
    else:
        return "F"
#example usage
print(grade(85))
```



Explanation: The original code had nested if-else statements which made it less readable and more complex.

#By using elif, we can simplify the logic and improve readability.