ASSIGNMENT-10.5

Lab 10 – Code Review and Quality: Using AI to Improve Code

Quality and Readability

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Task 1: Improving Variable & Function Names Original Code

def f(a, b):   return

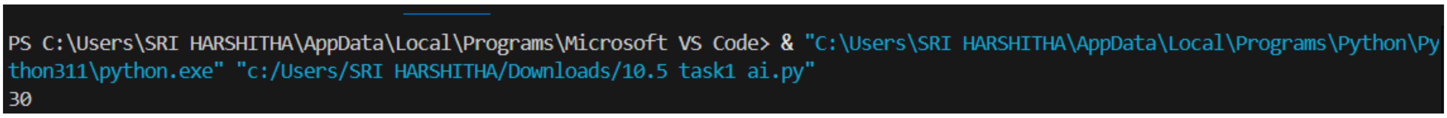
a + b print(f(10,

20))

CODE:

```
def add_numbers(first_number, second_number):

    """

    Returns the sum of two numbers.

    """

    return first_number + second_number



result = add_numbers(10, 20) print(result)
```

OUTPUT



```
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code> & "C:\Users\SRI HARSHITHA\AppData\Local\Programs\Python\Py
thon311\python.exe" "c:/Users/SRI HARSHITHA/Downloads/10.5 task1 ai.py"
30
```

Task Description #2 – Missing Error Handling

Task: Use AI to add proper error handling.

Sample Input Code: def

divide(a, b): return a / b

print(divide(10, 0))

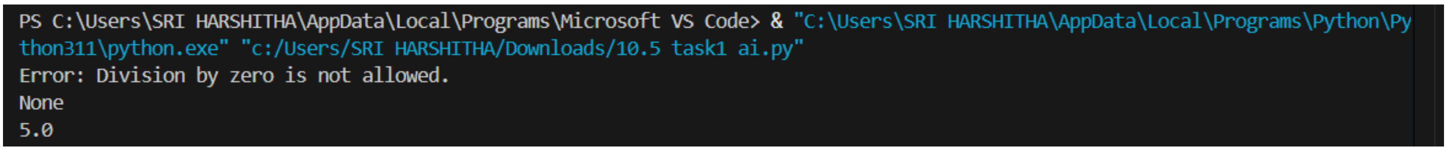
Expected Output:

- Code with exception handling and clear error messages

CODE :

```
def divide_numbers(dividend, divisor):

    """

    Divides two numbers safely.

    """

try:

        return dividend / divisor     except

ZeroDivisionError:

        return "Error: Division by zero is not allowed."

except TypeError:        return "Error: Please enter valid

numbers."



result = divide_numbers(10, 0) print(result)
```

OUTPUT:



```
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code> & "C:\Users\SRI HARSHITHA\AppData\Local\Programs\Python\Py
thon311\python.exe" "c:/Users/SRI HARSHITHA/Downloads/10.5 task1 ai.py"
Error: Division by zero is not allowed.
None
5.0
```

Task Description #3: Student Marks Processing System

The following program calculates total, average, and grade of a student, but it has poor readability, style issues, and no error handling.

```
marks=[78,85,90,66,88] t=0

for i in marks:

t=t+i

a=t/len(marks) if
```

```
a>=90: print("A")
elif a>=75:
print("B") elif
a>=60: print("C")
else:
print("F")
```

Task:

- Use AI to refactor the code to follow PEP 8 standards.

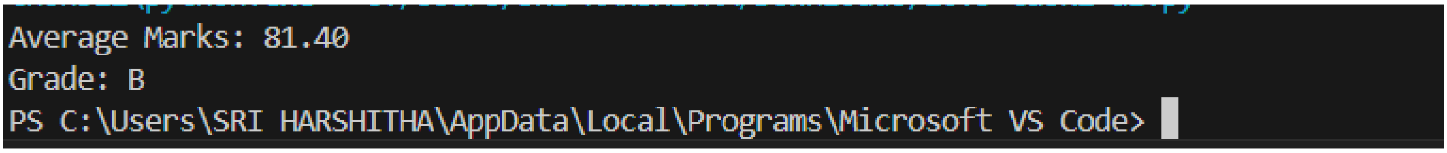
- Add meaningful variable names, functions, and comments.

- Add basic input validation and documentation.

CODE :

```
def calculate_average(marks_list):
    """
    Calculates the average of student marks.

    Args:
        marks_list (list): List of student marks
    Returns:
        float: Average marks
    """     if not marks_list:         raise ValueError("Marks list
cannot be empty.")

    return sum(marks_list) / len(marks_list)


def determine_grade(average_marks):
    """
    Determines grade based on average marks.
    """
    if average_marks >= 90:
        return "A"     elif
average_marks >= 75:
return "B"     elif average_marks
>= 60:
        return "C"     else:
        return "F"


def main():
    """
    Main function to process student marks.
    """
    marks = [78, 85, 90, 66, 88]
    try:
        average = calculate_average(marks)         grade =
determine_grade(average)

        print(f"Average Marks: {average:.2f}")
print(f"Grade: {grade}")

    except ValueError as error:         print(f"Error:
{error}")


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

OUTPUT:



```
Average Marks: 81.40
Grade: B
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code>
```

Task Description #4: Use AI to add docstrings and inline comments to the

following function. def factorial(n):

result = 1 for i in

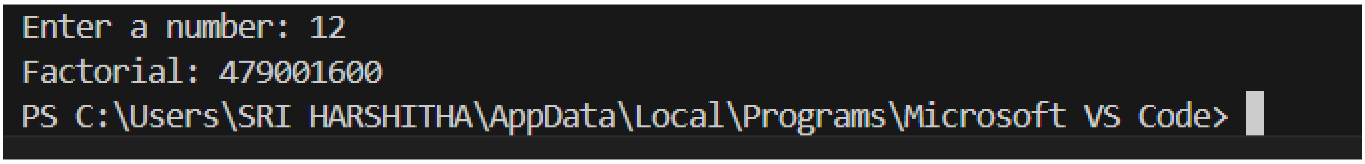
range(1,n+1):

result *= i

return result **CODE :**

```
def factorial(number):
    """
    Calculates the factorial of a given number.
    """
    if number < 0:        raise ValueError("Negative numbers not
allowed.")

    result = 1

    for i in range(1, number + 1):
        result *= i

    return result


if __name__ == "__main__":
    number = int(input("Enter a number: "))     print("Factorial:",
factorial(number))
```

OUTPUT:



```
Enter a number: 12
Factorial: 479001600
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code>
```

Task Description #5: Password Validation System (Enhanced) The following

Python program validates a password using only a minimum length check,

which is insufficient for real-world security requirements.

pwd = input("Enter password: ") if

len(pwd) >= 8: print("Strong") else:

print("Weak")

CODE : import re

def is_strong_password(password):

    """

    Checks whether the given password meets security standards.

    Rules:

- Minimum 8 characters

- At least one uppercase letter

- At least one lowercase letter

- At least one digit

- At least one special character

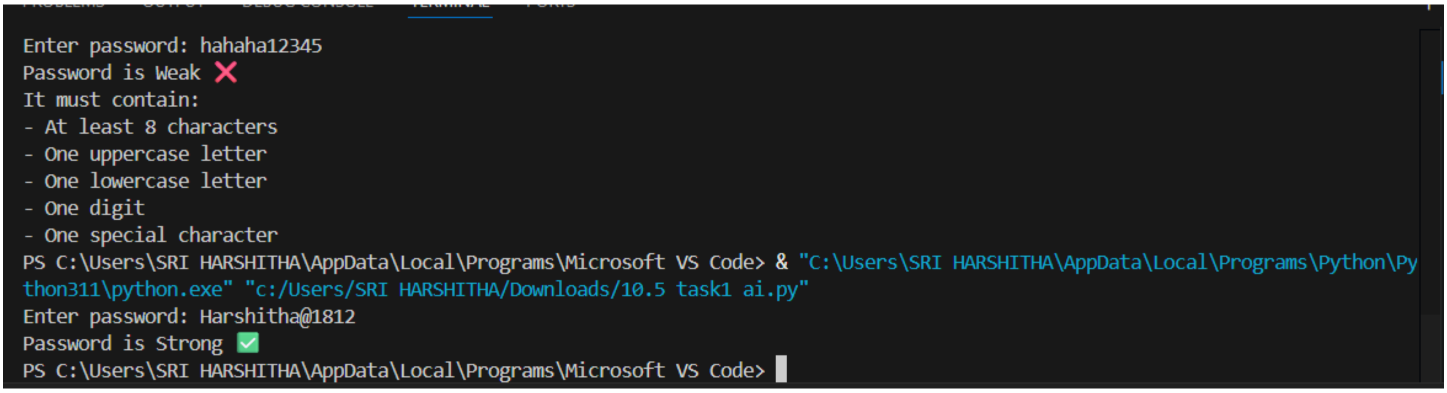
    Args: password (str): User-entered

password

```
    Returns:        bool: True if strong, False
otherwise
    """

    if len(password) < 8:
return False

    if not re.search(r"[A-Z]", password):
        return False
    if not re.search(r"[a-z]", password):
        return False

    if not re.search(r"[0-9]", password):        return
False

    if not re.search(r"[!@#$%^&*()_+{}[\]:;<>,.?~\\-]", password):        return
False

    return True


def main():
    """
    Main function for password validation.
    """
    user_password = input("Enter password: ")

    if is_strong_password(user_password):
        print("Password is Strong ")     else:
```

```
        print("Password is Weak ")

print("It must contain:")        print("- At

least 8 characters")        print("- One

uppercase letter")        print("- One

lowercase letter")        print("- One digit")

print("- One special character") if

__name__ == "__main__":


    main()
```

OUTPUT



```
Enter password: hahaha12345
Password is Weak ❌
It must contain:
- At least 8 characters
- One uppercase letter
- One lowercase letter
- One digit
- One special character
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code> & "C:\Users\SRI HARSHITHA\AppData\Local\Programs\Python\Py
thon311\python.exe" "c:/Users/SRI HARSHITHA/Downloads/10.5 task1 ai.py"
Enter password: Harshitha@1812
Password is Strong ✅
PS C:\Users\SRI HARSHITHA\AppData\Local\Programs\Microsoft VS Code> 
```