LAB 1 assignment

Question 1: - Write a program to count the number of vowels and consonants present in an input string.

Code: -

def count\_vowels\_and\_consonants():  
 vowel\_count = 0  
 consonant\_count = 0  
  
 print("Enter the string")  
  
 string = input()  
  
 # Converting the string to lower case to reduce the confusions/comparisons  
 string = string.lower()  
 for i in range(0, len(string)): # checks the entire string for vowels and consonants  
 if string[i] in ('a', "e", "i", "o", "u"): # Checks whether a character is a vowel  
 vowel\_count = vowel\_count + 1;  
 elif (string[i] >= 'a' and string[i] <= 'z'):  
 consonant\_count = consonant\_count + 1;  
 print("Total number of vowel and consonant are")  
 print("Vowels: ", vowel\_count)  
 print("Consonants: ", consonant\_count)

Question 2: - Write a program that accepts two matrices A and B as input and returns their product AB. Check if A & B are multipliable; if not, return error message.

Code: - def matrix\_input(prompt):  
 print(prompt)  
 r = int(input("Enter no of rows: "))  
 c = int(input("Enter no of columns: "))  
 matrix = []  
 print("Enter the matrix row by row:")  
 for i in range(r):  
 row = list(map(int, input().split())) # enter the row elements with space in between them  
 if len(row) != c:  
 print("Invalid row length. Please re-enter the row.") # if you don't enter the proper number of elements that are equal to that of the rows mentioned while inputting it'll show this message  
 row = list(map(int, input().split()))   
 matrix.append(row)   
 return matrix  
def matrix\_multiply(A, B):  
 r\_A, c\_A = len(A), len(A[0])  
 r\_B, c\_B = len(B), len(B[0])  
 if c\_A != r\_B:  
 return "Error: Matrices are not multiplicable."  
 result = [[0 for \_ in range(c\_B)] for \_ in range(r\_A)]  
 for i in range(r\_A):  
 for j in range(c\_B):  
 for k in range(c\_A):  
 result[i][j] += A[i][k] \* B[k][j]  
 return result  
def main():  
 A = matrix\_input("Enter matrix A:")  
 B = matrix\_input("Enter matrix B:")  
 result = matrix\_multiply(A, B)  
 if isinstance(result, str):  
 print(result)  
 else:  
 print("The product of matrices A and B is:")  
 for row in result:  
 print(" ".join(map(str, row)))  
if \_\_name\_\_ == "\_\_main\_\_":  
 main()

Question 3: - Write a program to find the number of common elements between two lists. The lists contain integers.

Code: - def count\_common\_elements(list1, list2):  
 set1 = set(list1)  
 set2 = set(list2)  
 # Find the intersection of the two sets  
 common\_elements = set1.intersection(set2)  
 # Return the number of common elements  
 return len(common\_elements)  
  
  
list1 = [1, 2, 3, 4, 5]  
list2 = [4, 5, 6, 7, 8]  
common\_count = count\_common\_elements(list1, list2)  
print(f"Number of common elements: {common\_count}")

Question 4: - Write a program that accepts a matrix as input and returns its transpose.

Code: - import numpy  
matrix = [[1, 2, 3], [4, 5, 6]]  
print(matrix)  
print("\n")  
print(numpy.transpose(matrix))