# LAB – 01

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Set: B

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

def count\_variables():

    count = 0

    vowels = "aeiou"

    for letter in string:

        if letter in vowels:

            count = count + 1

    return count

string = input("Enter an input string: ")

print(f"The number of vowels in your input string is {count\_variables()}")

1. 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.

def fun2(A, B):

    if len(A[0]) != len(B):

        return "Error: Number of columns in A is not equal to number of rows in B"

    result = [[0 for \_ in range(len(B[0]))] for \_ in range(len(A))]

    for i in range(len(A)):

        for j in range(len(B[0])):

            for k in range(len(B)):

                result[i][j] += A[i][k] \* B[k][j]

    return result

rows\_A = int(input("Enter the number of rows in matrix A: "))

cols\_A = int(input("Enter the number of columns in matrix A: "))

A = []

print("Enter the elements of matrix A:")

for i in range(rows\_A):

    row = list(map(int, input(f"Row {i+1}: ").split()))

    A.append(row)

rows\_B = int(input("Enter the number of rows in matrix B: "))

cols\_B = int(input("Enter the number of columns in matrix B: "))

B = []

print("Enter the elements of matrix B:")

for i in range(rows\_B):

    row = list(map(int, input(f"Row {i+1}: ").split()))

    B.append(row)

result = fun2(A, B)

if isinstance(result, str):

    print(result)

else:

    print("\nProduct of matrices A and B (AB):")

    for row in result:

        print(row)

1. Write a program to find the number of common elements between two lists. The lists contain integers.

def fun3(list1, list2):

    set1 = set(list1)

    set2 = set(list2)

    common\_elements = set1.intersection(set2)

    return len(common\_elements)

list1 = list(map(int, input("Enter the elements of the first list: ").split()))

list2 = list(map(int, input("Enter the elements of the second list: ").split()))

common\_count = fun3(list1, list2)

print(f"Number of common elements: {common\_count}")

1. Write a program that accepts a matrix as input and returns its transpose.

def fun4(matrix):

    return [list(row) for row in zip(\*matrix)]

rows = int(input("Enter the number of rows in the matrix: "))

cols = int(input("Enter the number of columns in the matrix: "))

matrix = []

print("Enter the elements of the matrix:")

for i in range(rows):

    row = list(map(int, input(f"Row {i+1}: ").split()))

    matrix.append(row)

transposed = fun4(matrix)

print("\nTranspose of the matrix:")

for row in transposed:

    print(row)