Lab 1

30-7-2024

Machine Learning

CSE22056

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

def count(input\_string):

vowels = 'aeiouAEIOU'

vcount = 0

ccount = 0

for char in input\_string:

if char.isalpha():

if char in vowels:

vcount += 1

else:

ccount += 1

return vcount, ccount

user\_input = input("Enter a string: ")

vowels, consonants = count(user\_input)

print(f"No.of vowels: {vowels}")

print(f"No.of consonants: {consonants}")

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

def multiply(A, B):

rows\_A = len(A)

cols\_A = len(A[0]) if rows\_A > 0 else 0

rows\_B = len(B)

cols\_B = len(B[0]) if rows\_B > 0 else 0

if cols\_A != rows\_B:

return "Error: Matrices cannot be multiplied due to incompatible dimensions."

result = [[0] \* cols\_B for \_ in range(rows\_A)]

for i in range(rows\_A):

for j in range(cols\_B):

for k in range(cols\_A):

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

return result

def main():

print("Enter matrix A")

A = []

rows\_A = int(input("No.of rows in matrix A: "))

cols\_A = int(input("No.of columns in matrix A: "))

for i in range(rows\_A):

row = list(map(int, input(f"Enter row {i+1} (space-separated values): ").split()))

A.append(row)

print("Enter matrix B:")

B = []

rows\_B = int(input("Number of rows in matrix B: "))

cols\_B = int(input("Number of columns in matrix B: "))

for i in range(rows\_B):

row = list(map(int, input(f"Enter row {i+1} (space-separated values): ").split()))

B.append(row)

result = multiply(A, B)

if isinstance(result, str):

print(result)

else:

print("Product matrix AB:")

for row in result:

print(" ".join(map(str, row)))

if \_\_name\_\_ == "\_\_main\_\_":

main()

**3) Write a program to find the number of common elements between two lists. The lists cntain integers.**

def count\_common\_elements(list1, list2):

set1 = set(list1)

set2 = set(list2)

common\_elements = set1.intersection(set2)

return len(common\_elements)

def main():

try:

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

except ValueError:

print("Invalid input. Please enter integers separated by spaces.")

return

try:

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

except ValueError:

print("Invalid input. Please enter integers separated by spaces.")

return

num\_common\_elements = count\_common\_elements(list1, list2)

print(f"Number of common elements: {num\_common\_elements}")

if \_\_name\_\_ == "\_\_main\_\_":

main()

**4) Write a program that accepts a matrix as input and returns its transpose.**

def transpose\_matrix(matrix):

transposed = list(map(list, zip(\*matrix)))

return transposed

def main():

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 matrix elements row by row, separated by spaces:")

for i in range(rows):

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

if len(row) != cols:

print(f"Error: Each row must have {cols} elements. Please try again.")

return

matrix.append(row)

transposed = transpose\_matrix(matrix)

print("Transposed matrix:")

for row in transposed:

print(" ".join(map(str, row)))

if \_\_name\_\_ == "\_\_main\_\_":

main()