MACHINE LEARNING

22AIE213

Assignment 1

Team-16

[Thanuj R – 22140, Prem Reddy YS – 22166, Mani Sankar D - 22112]

**Question 1:**

Algorithm for finding the number of vowels and consonants in a given strings.

1. Initialize count\_vowels to 0 #variable for vowels count

2. Initialize count\_consonents to 0 #variable for the consonant count

3. Set vowels to "aeiouAEIOU"

4. Input a string and store it in the variable string

5. For each character (char) in the string:

a. If char is in vowels:

i. Increment count\_vowels by 1

b. Else:

i. Increment count\_consonents by 1

6. Return count\_consonents, count\_vowels

Main code for input and printing the output:

1. Give a string input and store it in the variable “string”

2. Call the function finding\_vowels with the input string and store the results in [a, b]

3. Show output "The number of vowels: " b

4. Show output "The number of consonants: " a

Explaination:

The code just takes in the input of a string and then calls a function “finding\_vowels” in which the same string is passed as an argument. This function has two variables which stores the number of vowels and consonents present. Then we run a loop for finding the vowels present in the string.

**Question 2:**

Algorithm for multiplying the matrices:

Matrices A and B, and their dimensions(ROW\_A,COL\_A,ROW\_B, COL\_B)

1. Check if COL\_A is not equal to ROW\_B: #for checking columns of A and rows of B if Equal or not

a. Print "Multiplication not possible"

b. Return None

2. Else:

a. Initialize an empty matrix C with dimensions (ROW\_A, COL\_B)

b. For each row i from 0 to ROW\_A - 1:

i. For each column j from 0 to COL\_B - 1:

A. Initialize C[i][j] to 0

B. For each index k from 0 to COL\_A - 1:

a.Use this Logic for multiplying: C[i][j] += A[i][k] \* B[k][j]

3. Return matrix C

1.Give the Input of the dimensions of matrix A (ROW\_A, COL\_A)

2.Give Input of the elements of matrix A

3. Input the dimensions of matrix B (ROW\_B, COL\_B)

4. Input the elements of matrix B

5. Call multiply\_matrices function with matrices A and B, and their dimensions

6. Print "Matrix product AB:"

7. For each row in the result matrix C

a. Print the row

Explanation:

The given code mainly takes the input of the two matrices and then the function is called. when this is called first it checks if the number of columns of the matrix A is equal to the Matrix B or not. If it is equal it moves on to the next step; then multiplies the two matrices using certain logics and gives the output.

**Question 3:**

Algorithm to find same values in the lists:

1. Initialize set L3 as the intersection of sets L1 and L2

a. L3 = L1.intersection(L2)

2. Return L3

The Main Input

1. Initialize set L1 with elements {3, 2, 12, 3, 23}

2. Initialize set L2 with elements {2, 3, 4, 5, 10}

3. Call the function find\_same\_values function with sets L1 and L2 and store the result in L3

4. Print the common elements found in L3

Explanation:

This code gives input of the two separate sets and gives out the same elements as the output. We use the “intersection()” function for finding the same values in the two sets.

**Question 4:**

Algorithm for the Transposition of the matrix

1. Initialize an empty matrix result with dimensions (number of columns x number of rows) of the input matrix

a. result = [[0 for \_ in range(len(matrix))] for \_ in range(len(matrix[0]))]

2. For each row i from 0 to the number of rows in the input matrix - 1:

a. For each column j from 0 to the number of columns in the input matrix - 1

i. Set result[j][i] to the value of matrix[i][j]

3. Return the transposed matrix result

The main input part:-

1. Initialize the input matrix as [[1, 4], [2, 3]]

2. Call Transpose\_matrix function with the input matrix and store the result in L3

3. Print the transposed matrix L3

Explanation:-

This code takes in the input of a matrix and gives the transposition of the matrix. firstly it takes the matrix as user input then it calls the function “Transpose\_matrix” with passing this matrix as an argument. Then there is a variable created and initialized to zero and then the rows are changed to columns and columns are changed to rows using the logic and then it is again returned and printed.