**Assignment- A03**

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**Problem Statement:**Write a Python program to compute following computation on matrix:

a) Addition of two matrices

b) Subtraction of two matrices

c) Multiplication of two matrices

d) Transpose of a matrix

**Program:**

**def addition\_matrix(M1,M2,M3,r,c) : #Function for addition**

**for i in range(r) :**

**A = []**

**for j in range(c):**

**A.append(M1[i][j] + M2[i][j])**

**M3.append(A)**

**def substraction\_matrix(M1,M2,M3,r,c) : #Function for subtraction**

**for i in range(r) :**

**A = []**

**for j in range(c):**

**A.append(M1[i][j] - M2[i][j])**

**M3.append(A)**

**def multiplication\_matrix(M1,M2,M3,r1,c1,c2) : #Function for Multiplication**

**for i in range(r1) :**

**A = []**

**for j in range(c2) :**

**sum = 0**

**for k in range(c1) :**

**sum = sum + (M1[i][k] \* M2[k][j])**

**A.append(sum)**

**M3.append(A)**

**def find\_transpose\_matrix(M,r,c,T) : #Function for Transpose**

**for i in range(c):**

**A = []**

**for j in range(r):**

**A.append(M[j][i])**

**T.append(A)**

**def display(M,r,c): #Function for displaying matrix**

**for i in range(r):**

**print("\t\t",end=' ')**

**for j in range(c):**

**print("%4d"%M[i][j],end=' ')**

**print(" ")**

**def accept\_matrix(M):#Function for accepting matrix**

**print("Enter the rows and columns of the matrices : ")**

**r=int(input("\t row ="))**

**c=int(input("\t column ="))**

**print("Enter the elements in matrix : \n")**

**for i in range(r):**

**A = []**

**for j in range(c):**

**A.append(int(input()))**

**M.append(A)**

**def options():#Choices**

**print("1: Addition")**

**print("2: Subtraction\t")**

**print("3: Multiplication\t")**

**print("4: Transpose of 1st Matrix(M1)\t")**

**print("5: Transpose of 2nd Matrix(M2)\t")**

**print("6: Exit\t")**

**def main():**

**M1=[]**

**M2=[]**

**M3=[]**

**T1=[]**

**accept\_matrix(M1)**

**r1=len(M1)**

**c1=len(M1[0])**

**display(M1,r1,c1)**

**accept\_matrix(M2)**

**r2=len(M2)**

**c2=len(M2[0])**

**display(M2,r2,c2)**

**options()**

**while(True):**

**choice=int(input("Enter your choice : "))**

**if(choice==1):**

**print("Addition of two matrices : \n")**

**if(r1==r2 and c1==c2):**

**addition\_matrix(M1,M2,M3,r1,c1)**

**display(M3,r1,c1)**

**M3.clear()**

**else:**

**print("Addition is not possible")**

**elif(choice==2):**

**print("Subtraction of two matrices : \n")**

**if(r1==r2 and c1==c2):**

**substraction\_matrix(M1,M2,M3,r1,c1)**

**display(M3,r1,c1)**

**M3.clear()**

**else:**

**print("Subtraction is not possible")**

**elif(choice==3):**

**print("Multiplication of two matrices :\n")**

**if(c1==r2):**

**multiplication\_matrix(M1,M2,M3,r1,c1,c2)**

**display(M3,r1,c1)**

**M3.clear()**

**else:**

**print("Multiplication not possible(Columns not equal to rows)")**

**elif(choice==4):**

**print("Transverse of matrix M1 : \n")**

**find\_transpose\_matrix(M1,r1,c1,T1)**

**display(T1,r1,c1)**

**T1.clear()**

**elif(choice==5):**

**print("Transverse of matrix M2 : \n")**

**find\_transpose\_matrix(M2,r2,c2,T1)**

**display(T1,r2,c2)**

**T1.clear()**

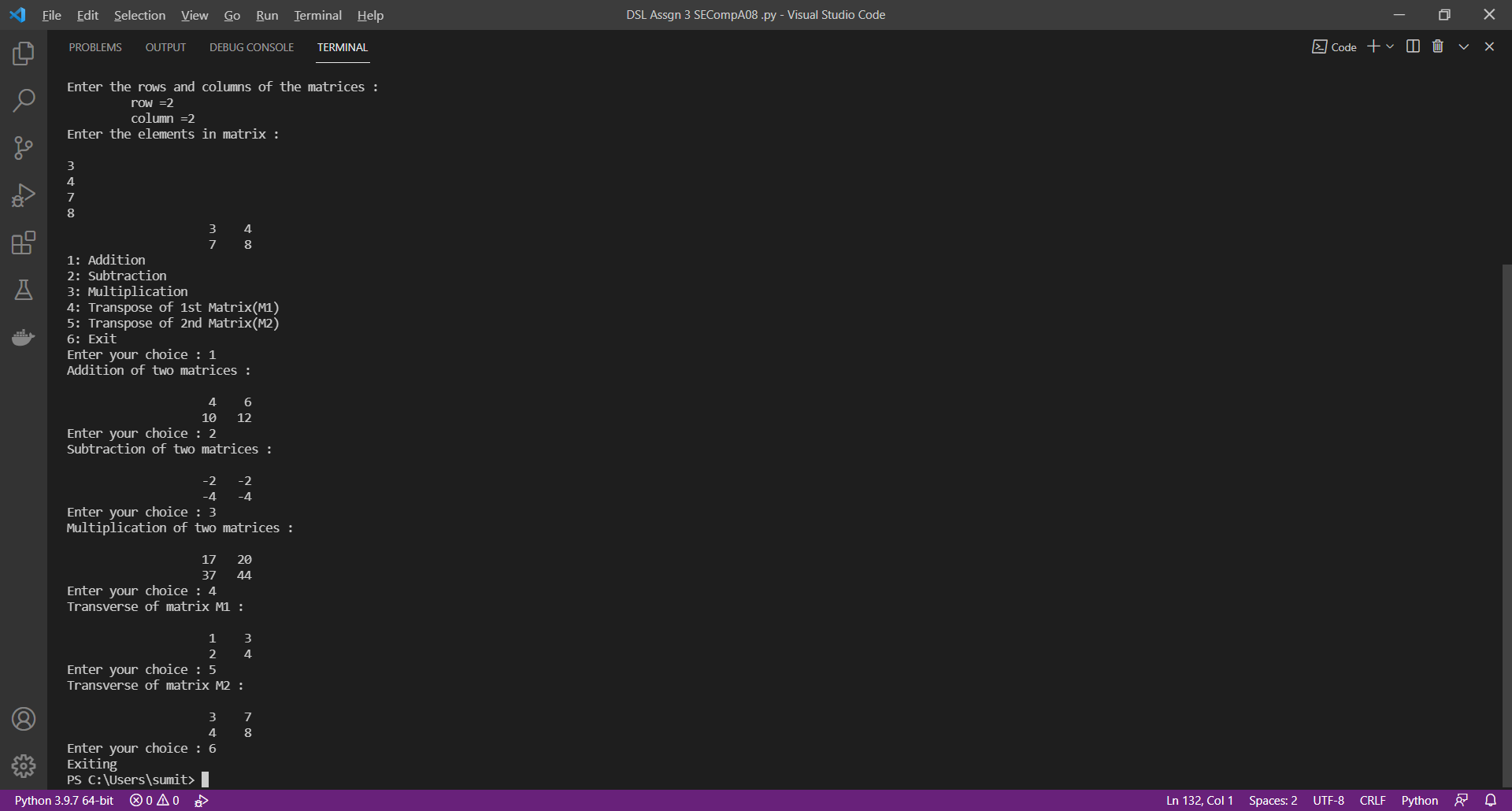
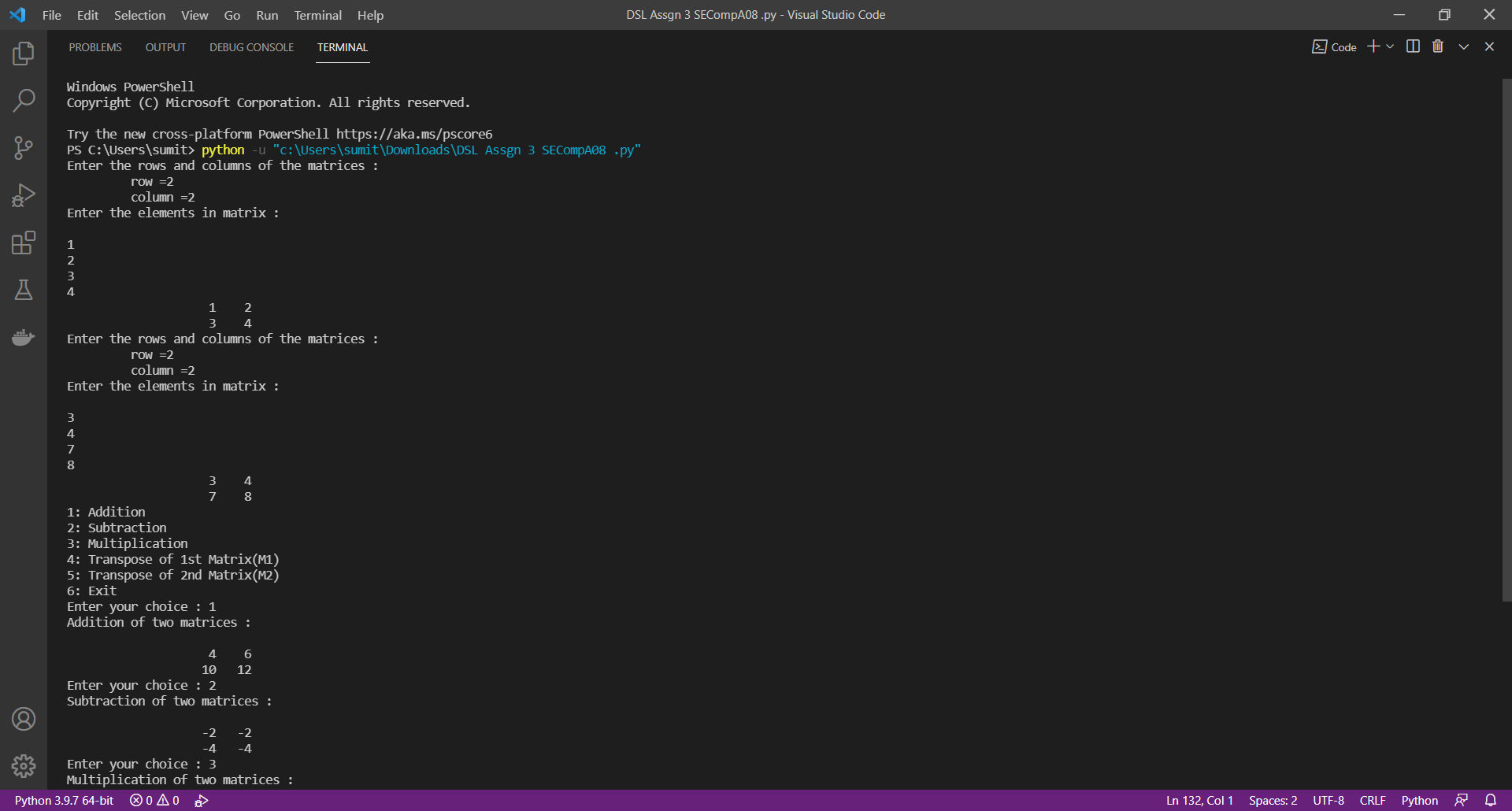
**else:**

**print("Exiting")**

**break**

**main()**

**Output:**

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