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Assignment 3

Find the fuzzy relation between two vectors R and S
R = 0.7 0.5 0.8 0.4
S = 0.9 0.6 0.2 0.1 0.7 0.5

➢

```
def cartesian():
    n = int(input("\nEnter number of elements in first set (A): "))
    A = []
    B = []
    print("Enter elements for A:")
    for i in range(0, n):
        ele = float(input())
        A.append(ele)
    m = int(input("\nEnter number of elements in second set (B): "))
    print("Enter elements for B:")
    for i in range(0, m):
        ele = float(input())
        B.append(ele)
    print("A = {"+str(A)[1:-1]+"}")
    print("B = {"+str(B)[1:-1]+"}")
    cart_prod = []
    cart_prod = [[0 for j in range(m)]for i in range(n)]
    for i in range(n):
        for j in range(m):
            cart_prod[i][j] = min(A[i],B[j])
    print("A x B = ")
    for i in range(n):
        for j in range(m):
            print(cart_prod[i][j],end="  ")
        print("\n")
    return

def minmax():
    r1 = int(input("Enter number of rows of first relation (R1): "))
    c1 = int(input("Enter number of columns of first relation (R1): "))
    rel1=[[0 for i in range(c1)]for j in range(r1)]
```

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print("Enter the elments for R:")
for i in range(r1):
    for j in range(c1):
        rel1[i][j]=float(input())

r2 = int(input("Enter number of rows of second relation (R2): "))
c2 = int(input("Enter number of columns of second relation (R2): "))
rel2=[[0 for i in range(c2)]for j in range(r2)]
print("Enter the elments for R:")
for i in range(r2):
    for j in range(c2):
        rel2[i][j]=float(input())

print("\nR1 = ")
for i in range(r1):
    for j in range(c1):
        print(rel1[i][j],end=" ")
    print("\n")
print("\nR2 = ")
for i in range(r2):
    for j in range(c2):
        print(rel2[i][j],end=" ")
    print("\n")



col=0
comp=[]
for i in range(r1):
    comp.append([])
    for j in range(c2):
        l=[]
        for k in range(r2):
            l.append(max(rel1[i][k],rel2[k][j]))
        comp[i].append(min(l))

print("\nR1 composition R2 =")
for i in range(r1):
    for j in range(c2):
        print(comp[i][j],end=" ")
```

```
        print("\n")
    return


def maxmin():
    r1 = int(input("Enter number of rows of first relation (R1): "))
    c1 = int(input("Enter number of columns of first relation (R1): "))
    rel1=[[0 for i in range(c1)]for j in range(r1)]
    print("Enter the elments for R:")
    for i in range(r1):
        for j in range(c1):
            rel1[i][j]=float(input())

    r2 = int(input("Enter number of rows of second relation (R2): "))
    c2 = int(input("Enter number of columns of second relation (R2): "))
    rel2=[[0 for i in range(c2)]for j in range(r2)]
    print("Enter the elments for R:")
    for i in range(r2):
        for j in range(c2):
            rel2[i][j]=float(input())

    print("\nR1 = ")
    for i in range(r1):
        for j in range(c1):
            print(rel1[i][j],end=" ")
        print("\n")
    print("\nR2 = ")
    for i in range(r2):
        for j in range(c2):
            print(rel2[i][j],end=" ")
        print("\n")


    col=0
    comp=[]
    for i in range(r1):
        comp.append([])
        for j in range(c2):
            l=[]
```

```
            for k in range(r2):
                l.append(min(rel1[i][k],rel2[k][j]))
            comp[i].append(max(l))

    print("\nR1 composition R2 =")
    for i in range(r1):
        for j in range(c2):
            print(comp[i][j],end=" ")
        print("\n")
    return

ch=1
while ch==1:
    print("MENU:\n----\n1->Cartesian Product\n2->maxmin Composition\n3-
>minmax Composition\n4->Exit")
    op=int(input("Enter Your Choice: "))
    if op==1:
        cartesian()
    elif op==2:
        maxmin()
    elif op==3:
        minmax()
    elif op==4:
        break
    else:
        print("Wrong Choice!")
    ch=int(input("Do you wish to continue (1-Yes | 0-No): "))
    print("\n")
```

Output :

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  JUPYTER

PS D:\College\3 year\TY 5\Soft Computing\Pratical> python -u "d:\College\3 year\TY 5\Soft Computing\Pratical\t.py"
MENU:
----
1->Cartesian Product
2->maxmin Composition
3->minmax Composition
4->Exit
Enter Your Choice: 3
Enter number of rows of first relation (R1): 2
Enter number of columns of first relation (R1): 2
Enter the elments for R:
0.7
0.5
0.8
0.4
Enter number of rows of second relation (R2): 2
Enter number of columns of second relation (R2): 3
Enter the elments for R:
0.9
0.6
0.2
0.1
0.7
0.5

R1 =
0.7 0.5

0.8 0.4


R2 =
0.9 0.6 0.2

0.1 0.7 0.5


R1 composition R2 =
0.5 0.7 0.5

0.4 0.7 0.5

0.7
0.5

0 0  Live Share   Ln 136, Col 16 (4024 selected)  Spaces: 4  UTF-8  CRLF  Python  3.10.4 64-bit
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  JUPYTER

0.5

R1 =
0.7 0.5

0.8 0.4


R2 =
0.9 0.6 0.2

0.1 0.7 0.5


R1 composition R2 =
0.7 0.6 0.5

0.8 0.6 0.4

Do you wish to continue (1-Yes | 0-No): 1


MENU:
----
1->Cartesian Product
2->maxmin Composition
3->minmax Composition
4->Exit
Enter Your Choice: 1

Enter number of elements in first set (A): 4
Enter elements for A:
0.7
0.5
0.8
0.4

Enter number of elements in second set (B): 6
0.9
0.6
0.2
0.1
0.7
0.5
A = {0.7, 0.5, 0.8, 0.4}

0 0  Live Share   Ln 136, Col 16 (4024 selected)  Spaces: 4  UTF-8  CRLF  Python  3.10.4 64-bit
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  JUPYTER

0.9
0.6
0.2
0.1
0.7
0.5
A = {0.7, 0.5, 0.8, 0.4}
B = {0.9, 0.6, 0.2, 0.1, 0.7, 0.5}
A x B =
0.7  0.6  0.2  0.1  0.7  0.5

0.5  0.5  0.2  0.1  0.5  0.5

0.8  0.6  0.2  0.1  0.7  0.5

0.4  0.4  0.2  0.1  0.4  0.4

Do you wish to continue (1-Yes | 0-No): 0


PS D:\College\3 year\TY 5\Soft Computing\Pratical>
```