BE CE D

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EXPERIMENT NO-3

Aim: Matrix multiplication using 2 step map-reduce.

Input:

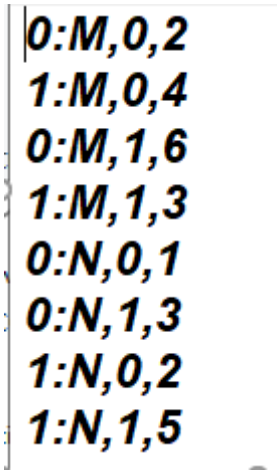
mat.txt:

```
M,0,0,2
M,0,1,4
M,1,0,6
M,1,1,3
N,0,0,1
N,0,1,3
N,1,0,2
N,1,1,5
```

Mapper1:

```
f=open("mat.txt","r")
g=open("map1_op.txt","w")
f1=f.readlines()
for x in f1:
    k=[]
    k=x.split(",")
    if(k[0]=="M"):
        g.write(k[2]+":"+k[0]+","+k[1]+","+k[3])
    else:
        g.write(k[1]+":"+k[0]+","+k[2]+","+k[3])
f.close()
g.close()
```

Output of Mapper 1 and Input to Reducer 1:



Reducer1:

```
f=open("map1_op.txt","r")
g=open("red1_op.txt","w")
f1=f.readlines()
z1=[]
z2=[]
for x in f1:
    k=[]
    r=[]
    k=x.split(":")
    r=k[1].split("\n")
    if(r[0][0]=="M"):
        z1.append([k[0],r[0]])
    else:
        z2.append([k[0],r[0]])
for i in z1:
    for j in z2:
        if(i[0]==j[0]):
            g.write(i[0]+":"+i[1][2]+","+j[1][2]+","+i[1][4]+","+j[1][4]+"\n")

f.close()
g.close()
```

Output of Reducer 1 and Input to Mapper2:

```
0:0,0,2,1
0:0,1,2,3
1:0,0,4,2
1:0,1,4,5
0:1,0,6,1
0:1,1,6,3
1:1,0,3,2
1:1,1,3,5
```

Mapper2:

```
f=open("red1_op.txt","r")
g=open("map2_op.txt","w")
f1=f.readlines()
for x in f1:
    g.write(x[2]+","+x[4]+":"+str(int(x[6])*int(x[8]))+"\n")
g.close()
f.close()
```

Output of Mapper 2 and input to Reducer 2:

```
0,0:2
0,1:6
0,0:8
0,1:20
1,0:6
1,1:18
1,0:6
1,1:15
```

Reducer2:

```
f=open("map2_op.txt","r")
g=open("red2_op.txt","w")
f1=f.readlines()
dict1={}
for x in f1:
    a=x.split(":")
    if(a[0] in dict1.keys()):
        dict1.update({a[0]:dict1[a[0]]+int(a[1])})
    else:
        dict1.update({a[0]:int(a[1])})
for i in dict1:
    g.write(i+":"+str(dict1[i])+"\n")
g.close()
f.close()
```

Output of Reducer 2:

```
0,0:10
0,1:26
1,0:12
1,1:33
```

Conclusion: Thus, we have completed matrix multiplication using 2 step map reducer program.