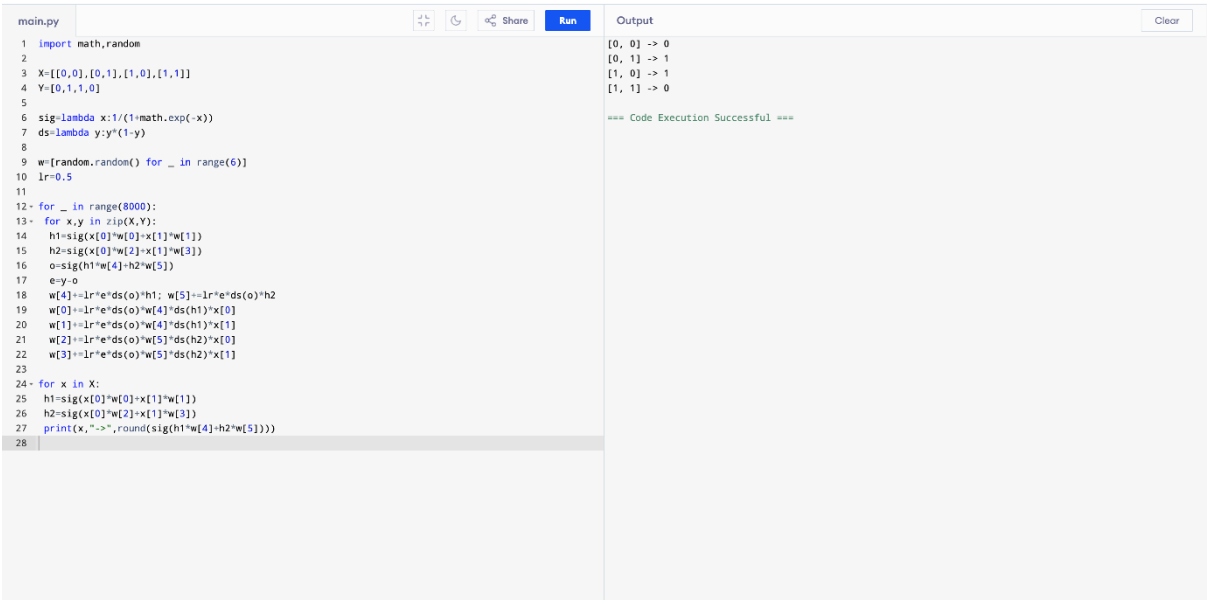
EX 4

CODING:

```
import math,random

X=[[0,0],[0,1],[1,0],[1,1]]
Y=[0,1,1,0]

sig=lambda x:1/(1+math.exp(-x))
ds=lambda y:y*(1-y)

w=[random.random() for _ in range(6)]
lr=0.5

for _ in range(8000):
    for x,y in zip(X,Y):
        h1=sig(x[0]*w[0]+x[1]*w[1])
        h2=sig(x[0]*w[2]+x[1]*w[3])
        o=sig(h1*w[4]+h2*w[5])
        e=y-o
        w[4]+=lr*e*ds(o)*h1
        w[5]+=lr*e*ds(o)*h2
        w[0]+=lr*e*ds(o)*w[4]*ds(h1)*x[0]
        w[1]+=lr*e*ds(o)*w[4]*ds(h1)*x[1]
        w[2]+=lr*e*ds(o)*w[5]*ds(h2)*x[0]
        w[3]+=lr*e*ds(o)*w[5]*ds(h2)*x[1]

for x in X:
    h1=sig(x[0]*w[0]+x[1]*w[1])
    h2=sig(x[0]*w[2]+x[1]*w[3])
    print(x,"->",round(sig(h1*w[4]+h2*w[5])))
```

OUTPUT:


main.py
Share
Run
Output
Clear
import math,random
X=[[0,0],[0,1],[1,0],[1,1]]
Y=[0,1,1,0]
sig=lambda x:1/(1+math.exp(-x))
ds=lambda y:y*(1-y)
w=[random.random() for _ in range(6)]
lr=0.5
for _ in range(8000):
for x,y in zip(X,Y):
h1=sig(x[0]*w[0]+x[1]*w[1])
h2=sig(x[0]*w[2]+x[1]*w[3])
o=sig(h1*w[4]+h2*w[5])
e=y-o
w[4]+=lr*e*ds(o)*h1; w[5]+=lr*e*ds(o)*h2
w[0]+=lr*e*ds(o)*w[4]*ds(h1)*x[0]
w[1]+=lr*e*ds(o)*w[4]*ds(h1)*x[1]
w[2]+=lr*e*ds(o)*w[5]*ds(h2)*x[0]
w[3]+=lr*e*ds(o)*w[5]*ds(h2)*x[1]
for x in X:
h1=sig(x[0]*w[0]+x[1]*w[1])
h2=sig(x[0]*w[2]+x[1]*w[3])
print(x,"->",round(sig(h1*w[4]+h2*w[5])))
[0, 0] -> 0
[0, 1] -> 1
[1, 0] -> 1
[1, 1] -> 0
=== Code Execution Successful ===