EXPERIMENT 4:

```
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

```
[0, 0] -> 0
[0, 1] -> 1
[1, 0] -> 1
[1, 1] -> 0

=== Code Execution Successful ===
```