

```

import math, random

def s(x):
    return 1/(1+math.exp(-x))

def ds(y):
    return y*(1-y)

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

w1=[[random.random(),random.random()],[random.random(),random.random()]]
w2=[random.random(),random.random()]
b1=[random.random(),random.random()]
b2=random.random()

lr=0.5

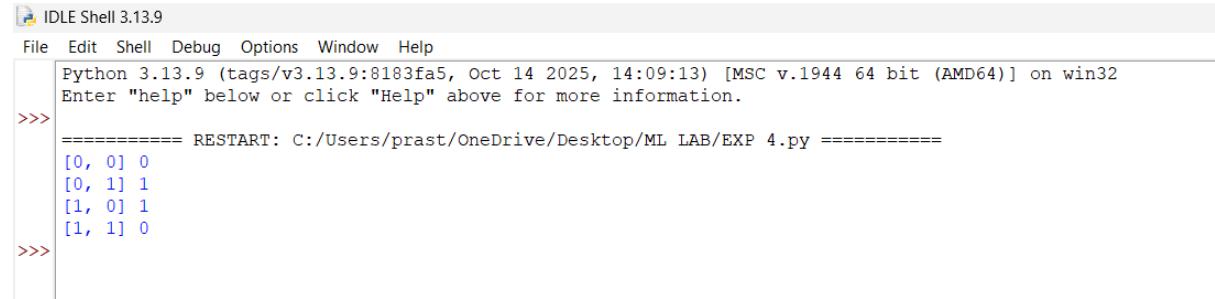
for _ in range(5000):
    for x,y in zip(X,Y):
        h=[s(x[0]*w1[0][i]+x[1]*w1[1][i]+b1[i]) for i in range(2)]
        o=s(h[0]*w2[0]+h[1]*w2[1]+b2)
        d_o=(y-o)*ds(o)
        d_h=[d_o*w2[i]*ds(h[i]) for i in range(2)]
        for i in range(2):
            w2[i]+=lr*d_o*h[i]
            w1[0][i]+=lr*d_h[i]*x[0]
            w1[1][i]+=lr*d_h[i]*x[1]
            b1[i]+=lr*d_h[i]
        b2+=lr*d_o

```

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for x in X:
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    h=[s(x[0]*w1[0][i]+x[1]*w1[1][i]+b1[i]) for i in range(2)]  
    o=s(h[0]*w2[0]+h[1]*w2[1]+b2)  
    print(x,round(o))
```

OUTPUT:



The screenshot shows the IDLE Shell interface with the title bar "IDLE Shell 3.13.9". The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main window displays the Python interpreter output. It starts with the Python version information: "Python 3.13.9 (tags/v3.13.9:8183fa5, Oct 14 2025, 14:09:13) [MSC v.1944 64 bit (AMD64)] on win32". Below this, it says "Enter "help" below or click "Help" above for more information.". The command prompt shows two lines of code being run:

```
>>> ===== RESTART: C:/Users/prast/OneDrive/Desktop/ML LAB/EXP 4.py =====  
[0, 0] 0  
[0, 1] 1  
[1, 0] 1  
[1, 1] 0
```