

```

"""
inputs x1 x2 x3      output
-----
      1  0  0        1
      0  1  1        0
      1  1  0        1
      1  1  1        0
      0  0  1        0
      1  0  1        1
"""

#update this if changing width
size = 5
counter = 0
data = [
    [-1,1,0,0,1],
    [-1,0,1,1,0],
    [-1,1,1,0,1],
    [-1,1,1,1,0],
    [-1,0,0,1,0],
    [-1,1,0,1,1]
]
N = len(data)
#change depending on # of inputs
_weight = [0,0,0,0]

def netoutput(x_num):
    sum = 0
    X = data[x_num]
    for i in range(len(X)-1):
        sum += _weight[i] * X[i]
    if sum > 0:
        return 1
    else:
        return 0

def weight_calc(check, xi):
    global counter
    if check == 0:
        counter +=1

```

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else:
    for i in range(len(_weight)):
        _weight[i] = _weight[i] + check * xi[i]

# w <- w + (output - netoutput) * X
def weight_update():
    global counter
    while counter != N:
        counter = 0
        print("\n-----\n")
        for xi in range(len(data)):
            print("X%d" % (xi+1))
            Yi = data[xi][size-1]
            check = Yi-netoutput(xi)
            weight_calc(check, data[xi])
            print(_weight)
        print("\n-----\n")
        print("Final weight:", _weight)

weight_update()

```

OUTPUT:

X1

[-1, 1, 0, 0]

X2

[0, 1, -1, -1]

X3

[-1, 2, 0, -1]

X4

[0, 1, -1, -2]

X5

[0, 1, -1, -2]

X6

[-1, 2, -1, -1]

X1

[-1, 2, -1, -1]

X2

[-1, 2, -1, -1]

X3

[-1, 2, -1, -1]

X4

[0, 1, -2, -2]

X5

[0, 1, -2, -2]

X6

[-1, 2, -2, -1]

X1

[-1, 2, -2, -1]

X2

[-1, 2, -2, -1]

X3

[-1, 2, -2, -1]

X4

[-1, 2, -2, -1]

X5

[-1, 2, -2, -1]

X6

[-1, 2, -2, -1]

Final weight: [-1, 2, -2, -1]

Comment on result:

The results are what I expected them to be when I did them hand written for 11.5. The way it works is that there is a counter that the while loop checks which essentially checks if the weights have not changed in one epoch. The counter updates through the `weight_calc()` function every time it sees `netoutput() = 0`. If the counter goes through one epoch with no change it prints out the final weight which is `[-1, 2, -2, -1]`. My code also prints out the weights for each row.