

Not, And, and Or

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1 Not

$$y = \frac{1}{1 + e^{100x-36}}$$

2 And

$$y = \frac{1}{1 + e^{-66(x_1+x_2)+100}}$$

3 Or

$$y = \frac{1}{1 + e^{-100(x_1+x_2)+63}}$$

4 Code

```
from math import e

def f(w, b, x):
    return 1 / (1 + (e ** (-w * x + b)))

def g(w,b,x,y):
    return 1 / (1 + (e ** (-w * (x+y) + b)))

def singleValueHillClimbing(xs, ys):
    bestW = 0
    bestB = 0
    bestError = 100000000
    w = 100
    b = 100
    while w > -100:
        while b > -100:
```

```

currError = 0
for i in range(len(xs)):
    currError += (ys[i] - f(w, b, xs[i])) ** 2
if(currError < bestError):
    bestError = currError
    bestW = w
    bestB = b
    print(bestW, bestB, currError)
b -= .1
b = 100
w -= .1

def doubleValueHillClimbing(xs, ys, zs):
    bestW = 0
    bestB = 0
    bestError = 100000000
    w = 100
    b = 100
    while w > -100:
        while b > -100:
            print(w,b)
            currError = 0
            for i in range(len(xs)):
                currError += (zs[i] - g(w, b, xs[i], ys[i])) ** 2
            print(w,b,currError)
            if(currError < bestError):
                bestError = currError
                bestW = w
                bestB = b
                print(bestW, bestB, currError)
            b -= .1
        b = 100
    w -= .1

```