PadhAI: Information Theory and Cross Entropy

One Fourth Labs

Code for Cross Entropy Loss Function

What are the changes we need to make in the code

1. Here is the Python code for Gradient Descent with Cross Entropy Loss function

```
X = [0.5, 2.5]
Y = [0, 1]

def f(w, b, x):
    #Sigmoid with parameters w and b
    return 1.0 / (1.0 + np.exp(-(w*x + b)))

def error(w, b):
# Cross Entropy Loss Function
    err = 0.0
    for x,y in zip(X, Y):
        fx = f(w, b, x)
        err +=  - [(1-y) * math.log(1-fx, 2) + y * math.log(fx, 2)]
    return err

def grad_b(w, b, x, y):
    fx = f(w, b, x)
    return (fx - y)

def grad_w(w, b, x, y):
    fx = f(w, b, x)
    return (fx - y) * x

def do_gradient_descent():
    w, b, eta = 0, -8, 1.0
    max_epochs = 1000
    for i in range(max_epochs):
        dw, db = 0, 0
        for x, y in zip(X, Y):
            dw += grad_w(w, b, x, y)
            db += grad_b(w, b, x, y)
        w = w - (eta * dw)
        b = b - (eta * b)
```

2. Here, the functions f(w, b, x), grad_b(w,b,x,y) and grad_w(w,b,x,y) have been changed to suit the Cross entropy loss function.