### **Loss function for Multi-Class Classification**

What is the loss function that you can use for a multi-class classification problem

1. Here is an illustration of a sample multi-class classification Neural Network
2. Consider the following values for the parameters
   1. b = [0 0]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 0.1 | 0.3 | 0.8 | -0.4 |  |
| W1= | --0.3 | -0.2 | 0.5 | 0.5 |
|  | -0.3 | 0.1 | 0.5 | 0.4 |
|  | 0.2 | 0.5 | -0.9 | 0.7 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 0.3 | 0.8 | -0.2 | -0.4 |  |
| W2= | 0.5 | -0.2 | -0.3 | 0.5 |
|  | 0.3 | 0.1 | 0.6 | 0.6 |

1. Consider a case where x = [-0.6 -0.6 0.2 0.3] and true class y =[0 1 0]
2. The output values are as follows
   1. Cross Entropy Loss
3. Consider another case where x = [0.6 0.4 0.6 0.1] and true class y =[0 0 1]
4. The output values are as follows
   1. Cross Entropy Loss
5. A quick summary of what we’ve learned so far
   1. Given weights, we know how to compute the model’s output for a given input
   2. This is called Forward-propagation.
   3. Given weights, we know how to compute the model’s loss for a given input
   4. But who will give us the weights?
6. The weights can be obtained from the learning algorithm