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Week 3: Assignment 3

The due date for submitting this assignment has passed.

Due on 2022-08-17, 23:59 IST.

Assignment submitted on 2022-08-17, 20:04 IST

1) Assume you are developing a model to predict the probability as an output. Pick out the appropriate Activation function. ***1 point***

- linear
- sigmoid
- tanh
- Relu

Yes, the answer is correct.
Score: 1

Accepted Answers:
sigmoid

2) The pre-activation at layer i can be best described as the ***1 point***

- weighted sum of all the inputs at layer i
- sum of all the the inputs at layer i
- weighted sum of all the inputs at layer $i+1$
- sum of all the inputs at layer $i+1$
- weighted sum of all the inputs at layer $i-1$

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sum of all the inputs at layer $i-1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
weighted sum of all the inputs at layer $i-1$

3) Consider a Machine Learning model that is applied to a specific set of inputs. Actual output being y_i = [10, 5, 7, 8, 6] and the predicted output being $\hat{y}_i$ = [9, 6, 5, 7, 5], Compute Mean Squared error loss.

1.60

Yes, the answer is correct.
Score: 1

Accepted Answers:
(Type: Numeric) 1.6

1 point

4) Consider a Classification problem with k classes. The output being a probability distribution, which of the following is the best output function? ***1 point***

- Linear
- Sigmoid
- tanh
- softmax

Yes, the answer is correct.
Score: 1

Accepted Answers:
softmax

5) Given the output $y_j = O(a_l)_j \text{ and } a_l = [2.5, 3.6, 4.2, 5]$. If 'O' is the softmax function, compute the value of $\hat{y} = [\hat{y}_1, \hat{y}_2, \hat{y}_3, \hat{y}_4]$? ***1 point***

- [0.046, 0.139, 0.253, 0.562]
- [0.046, 0.253, 0.562, 0.139]
- [0.253, 0.046, 0.139, 0.562]
- [0.562, 0.046, 0.139, 0.253]

Yes, the answer is correct.
Score: 1

Accepted Answers:
[0.046, 0.139, 0.253, 0.562]

6) The information content is high for an event when the probability of the event is ***1 point***

- high
- low
- 1
- maximum

Yes, the answer is correct.
Score: 1

Accepted Answers:
low

7) Assume you have four inputs to a Feed Forward neural network, the first hidden layer also has four neurons, and there are three output classes, what is the dimension of the weight matrix, W_1 between the input layer and the first hidden layer, given that there is only one hidden layer? ***1 point***

- $\mathbb{R}^{3\times 3}$
- $\mathbb{R}^{4\times 3}$
- $\mathbb{R}^{4\times 4}$
- $\mathbb{R}^{3\times 4}$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$\mathbb{R}^{4\times 4}$

8) In a Feed Forward Neural Network, if the outputs take real values then which of the following output activation function and error function do you prefer? ***1 point***

- Linear, cross entropy
- Softmax, cross entropy
- Linear, Squared error
- Softmax, Squared error

Yes, the answer is correct.
Score: 1

Accepted Answers:
Linear, Squared error

9) The activation layer at any layer i is given by ***1 point***

- $h_i(x) = b_i + W_i h_{i-1}(x)$
- $h_i(x) = g(a_i(x))$
- $h_i(x) = O(aL)$
- $h_i(x) = a_i + W_i h_{i-1}(x)$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$h_i(x) = g(a_i(x))$

10) Identify the loss function for a classification problem to choose one out of K Classes. ***1 point***

- Squared error

- Absolute error
- $\underset{\theta}{\text{Minimize}} \mathcal{L}(\theta) = -\log(\hat{y}_l)$
- $\underset{\theta}{\text{Maximize}} \mathcal{L}(\theta) = -\log(\hat{y}_l)$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$\underset{\theta}{\text{Minimize}} \mathcal{L}(\theta) = -\log(\hat{y}_l)$