Week 3 : Assignment 3

The due date for submitting this assignment has passed.

Due on 2025-02-12, 23:59 IST.

Assignment submitted on 2025-02-10, 18:33 IST

1) State whether the following statement is True/False. ***1 point***

The Perceptron learning algorithm can solve problems with non-linearly separable data.

- ○ True
- ◉ False

Yes, the answer is correct.
Score: 1
Accepted Answers:
False

2) In backpropagation, which method is used to compute the gradients? ***1 point***

- ○ Gradient descent
- ◉ Chain rule of derivatives
- ○ Matrix factorization
- ○ Linear regression

Yes, the answer is correct.
Score: 1
Accepted Answers:
Chain rule of derivatives

3) Which activation function outputs values in the range [−1,1]? ***1 point***

- ○ ReLU
- ◉ Tanh
- ○ Sigmoid
- ○ Linear

Yes, the answer is correct.

Score: 1

Accepted Answers:
Tanh

4) What is the primary goal of regularization in machine learning? ***1 point***

- To improve the computational efficiency of the model
- To reduce overfitting
- To increase the number of layers in a network
- To minimize the loss function directly

Yes, the answer is correct.
Score: 1

Accepted Answers:
To reduce overfitting

5) Which of the following is a regularization technique where we randomly deactivate neurons during training? ***1 point***

- Early stopping
- L1 regularization
- Dropout
- Weight decay

Yes, the answer is correct.
Score: 1

Accepted Answers:
Dropout

6) Which activation function has the vanishing gradient problem for large positive or negative inputs? ***1 point***

- ReLU
- Sigmoid
- GELU
- Swish

Yes, the answer is correct.
Score: 1

Accepted Answers:
Sigmoid

7) Which activation function is defined as: $f(x)=x\cdot\sigma(x)$, where $\sigma(x)$ is the sigmoid function? ***1 point***

- Swish
- ReLU
- GELU
- SwiGLU

Yes, the answer is correct.
Score: 1

Accepted Answers:
Swish

8) What does the backpropagation algorithm compute in a neural network? ***1 point***

- Loss function value at each epoch
- Gradients of the loss function with respect to weights of the network
- Activation values of the output layer
- Output of each neuron

Yes, the answer is correct.

Score: 1

Accepted Answers:

Gradients of the loss function with respect to weights of the network

9) Which type of regularization encourages sparsity in the weights? ***1 point***

- ○ L1 regularization
- ◉ L2 regularization
- ○ Dropout
- ○ Early stopping

No, the answer is incorrect.
Score: 0

Accepted Answers:

L1 regularization

10) What is the main purpose of using hidden layers in an MLP? ***1 point***

- ○ Helps to the network bigger
- ○ Enables us to handle linearly separable data
- ◉ Learn complex and nonlinear relationships in the data
- ○ Minimize the computational complexity

Yes, the answer is correct.
Score: 1

Accepted Answers:

Learn complex and nonlinear relationships in the data