

SCOA7

April 29, 2022

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[6]: import numpy as np
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[ ]:
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[7]: class NeuralNetwork:
    def __init__(self, input_nodes, hidden_nodes):
        self.layers = [input_nodes, hidden_nodes, 1]
        self.__init_weights()

    def __init_weights(self):
        self.W = np.array([None for _ in range(len(self.layers) - 1)])
        self.b = np.array([None for _ in range(len(self.layers) - 1)])
        for i in range(len(self.layers) - 1):
            self.W[i] = np.ones((self.layers[i+1], self.layers[i]))
            self.b[i] = np.zeros((self.layers[i+1]))

    def __train(self, X, y):
        a = np.array([None for _ in range(len(self.layers) - 1)])
        a[0] = X.copy()
        a[1] = np.dot(self.W[0], a[0]) + self.b[0]

        self.W[1] -= -a[1]
        self.b[1] -= -1
        for i in range(len(a[0])):
            self.W[0][:, i] -= -np.sum(self.W[1] * a[0][i], axis = 0)
            self.b[0] -= -1

    def fit(self, X, y):
        for i in range(len(X)):
            self.__train(X[i], y[i])
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[8]: model = NeuralNetwork(2, 2)
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[9]: model.fit([
        np.array([1, 0])
    ], [1])
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[10]: print(f'Value of W11: {model.W[0][0,0]}')
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Value of W11: 3.0

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