Prac 2
Neural Networks and Deep Learning, 2020

August 17, 2020

1. Which of the following sets of points are linearly separable?
   (a) Class1: $p_1 = (0,0,0), p_2 = (1,1,1), p_3 = (2,2,2)$
   Class2: $n_1 = (3,3,3), n_2 = (4,4,4), n_3 = (5,5,5)$
   (b) Class1: $p_1 = (0,0,0), p_2 = (1,1,1), p_3 = (4,4,4)$
   Class2: $n_1 = (2,2,2), n_2 = (3,3,3)$
   (c) Class1: $p_1 = (0,0,0,0), p_2 = (1,0,1,0), p_3 = (0,1,0,1)$
   Class2: $n_1 = (1,1,1,1), n_2 = (1,1,1,2), n_3 = (1,2,1,1)$
   (d) Class1: $p_1 = (0,0,0,0,0), p_2 = (0,1,0,1,0), p_3 = (1,0,1,0,1)$
   Class2: $n_1 = (1,1,1,1,1), n_2 = (1,1,1,1,2), n_3 = (0,1,2,1,1)$
2. For a specific problem in $\mathbb{R}^2$, assume that we know that available data can be completely separated into two classes using an ellipsoid instead of a straight line. Suggest a modification of the perceptron algorithm that determines the equation of the appropriate circle.
3. we want to learn an "OR" gate for a 2 dimensional input using a perceptron. Obtain the perceptron learning rule.