Homework #6

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0	0	1	1	1
<1, 0>	<2, 0>	<1, 1>	<0, 1>	<0, 2>

Use KNN with k = 1 and k = 3 to classify:

x1 = <1, 2>
x2 = <2, 2>

Measure F1 and accuracy assuming the ground truth is:

y1 = 0, y2 = 1

Compare such measures with those obtained for the biased classifier.

distances

	0	0	1	1	1	K-nearest	
	$(1,0)$	$(2,0)$	$(1,1)$	$(0,1)$	$(0,2)$	K=1	k=3
1,2)	2	$\sqrt{5}$	1	$\sqrt{2}$	1	1	1,1,1
2,2)	$\sqrt{5}$	2	$\sqrt{2}$	$\sqrt{5}$	2	1	1,1,0

K=1

$(1,2) \in C(1) : y_1 = 1$
$(2,2) \in C(1) : y_2 = 1$

C. Matrix

	0	1
0	Ⓞ	0
1	1	1

$$F_1 = \frac{2 \times 0}{2 \times 0 + 0 + 1} = 0$$

$$Accuracy = \frac{1}{2}$$

K=3

$(1,2) \in C(1) : y_1 = 1$ with majority
$(2,2) \in C(1) : y_2 = 1$ with majority

C. Matrix

3

2

	0	1
0	0	0
1	1	1

$$F_1 = \frac{2 \cdot 0}{2 \cdot 0 + 1 + 0} = 0$$

$$Accuracy = \frac{1}{2}$$

The most prominent label is 1, hence the biased classifier will yield 1 for every inference, thus being equal to the above classifications.