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HW # 8

Precision = true positive/ total predicted positive

Recall = true positive/ total actual positive

F-score = 2*(precision* recall)/ (precision + recall)

Problem 1:

0.9

Precision: 2/2 = 1

Recall: 2/8

F-score: 2 * (2/8) / (1 +2/8) = 0.4

0.6

Precision: 5/9

Recall: 5/8

F-score: 2 * (5/9*5/8) / (5/9+5/8) = 0.588

0.4

Precision: 6/14

Recall: 6/8

F-score: 2 * (6/14*6/8) / (6/14 +6/8) = 0.545

0.1

Precision: 7/18

Recall: 7/8

F-score: 2* (7/18*7/8) / (7/18 + 7/8) = 0.538

Problem 2:

A.

W1 = 1
W2 = 1
W3 = -3

A = (1,1)
C = (2,2)
D = (3,4)

E(A) = |1*1 + 1+1 -3| = |-1| = 1
E(C) = |1*2+1*2 -3| = 1
E(D) = |1*3+1*4-3| = 4

E_T = 1+1+4 = 6

B.

E(A) = -1 * < 1,1,1> = <-1,-1,-1>
E(C) = 1 * < 2,2 1> = <2,2,1>
E(D) = 1 * <3,4,1> = <3,4,1>

$\nabla \sim E| \sim w$ = <4,5,1>

C.
<1,1,-3> - 0.1 * <4,5,1> = <0.6, 0.5, -3.1>

D.

The new line is 0.6x + 0.5y – 3.1 > 0 then blue else red

A, B,C is classified as red.
D, E is classified as blue.

E.

A,B, D is misclassified.
E(A) = |0.6*1+0.5*1 – 3.1| = 2
E(B) = |0.6*1+0.5*3-3.1| = 1
E(D) = |0.6*3+0.5*4-3.1| = 0.7

$E_T = 2+1+0.7= 3.7$