MALIS
Group Exercise
January 3 2023

Group Name:	
Group Members:	

1 Decision trees

Suppose you are given six training points listed in the table below for a classification problem with two binary attributes x_1, x_2 and three classes Y = {1,2,3}.

x_1	x_2	Y
1	1	1
1	1	1
1	1	2
1	0	3
0	0	2
0	0	3

a) Draw the decision tree resulting from the first split. Make sure to label the split attribute, which branch is which and what predicted label is in each leaf. You may approximate $\log_2 3$ = 19/12

b) How would this tree classify a sample with x_1=0 and x_2 =1?

2 AdaBoost

You have six training points (A, B, C, D, E, F) and five classifiers (h_{1-5}) which make the following misclassifications:

Classifier	Misclassified					
1	A			D		F
2				D		
3		B	C			
4	A	B				F
5		B	C	D		

a) Complete the following information for a round of boosting with these classifiers and training data.

	Round 1
Weight of A	
Weight of B	
Weight of C	
Weight of D	
Weight of E	
Weight of F	
Error rate of h_1	
Error rate of h_2	
Error rate of h_3	
Error rate of h_4	
Error rate of h_5	

b) Pick the classifier with the lowest error rate and estimate the following values:
- Chosen weak classifier:
- Classifier error:
- α: