

a. Entropy

Target Class	count	p	-p*LOG2(p)
+	4	0.444	0.520
-	5	0.556	0.471
		Entropy	0.991

b. split

split a1

a1	T	F	
+	3	1	
-	1	4	
weight	0.444	0.556	weighted
Entropy	0.811	0.722	0.762

$$\text{gain1} = 0.991 - 0.762 = 0.229$$

split a2

a2	T	F	
+	2	2	
-	3	2	
weight	0.556	0.444	weighted
Entropy	0.971	1.000	0.984

$$\text{gain2} = 0.991 - 0.984 = 0.007$$

choose a1

c. gini index

Target Class		p	p^2
+	4	0.444	0.198
-	5	0.556	0.309
		Gini	0.494

split a1

a1	T	F	
+	3	1	
-	1	4	
weight	0.444	0.556	weighted
Gini	0.375	0.320	0.344

$$\text{gain1} = 0.494 - 0.344 = 0.149$$

split a2

a2	T	F	
+	2	2	
-	3	2	
weight	0.556	0.444	weighted
Gini	0.480	0.500	0.489

$$\text{gain2} = 0.494 - 0.489 = 0.005$$

choose a1