Labels: 0, 1, 2

Features: 4 booleans

first is predicted split on label 0

	0	1	2	3
0	1	1	1	1
0	1	1	0	0
0	1	0	1	0
1	0	1	1	1
1	0	1	0	1
1	0	1	1	0
2	0	1	0	0
2	0	0	1	1
2	0	0	0	1
2	0	0	1	0
2	0	0	0	0

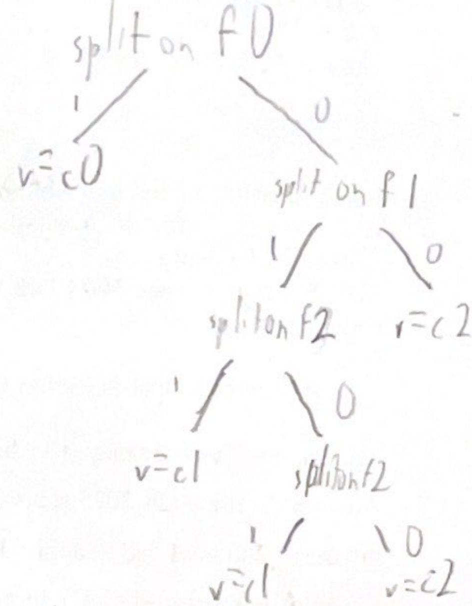
00011122222

000|11122222

000|1112|2222

000|11|12|2222

000|11|1|2|2222



Step 1: Gini imp for subnode: $1 - \sum p_k^2$ where p_k is prob class picked for class k

weighted: $\sum \frac{s_s}{s_T}(g_s)$

★ Gini on <u>f0</u>:

r: $1-(1^2+0^2)=0$ l: $1-\left(0^2+\frac{3}{8}^2+\frac{5}{8}^2\right)=.46875$

w: $\frac{3}{11}\cdot 0+\frac{8}{11}\cdot .46875=.34\overline{09}$

on f2:

r: $1-\left(\frac{1}{3}^2+\frac{1}{3}^2+\frac{1}{3}^2\right)=\frac{2}{3}$ l: $1-\left(\frac{1}{5}^2+\frac{1}{5}^2+\frac{3}{5}^2\right)=.56$

w: $\frac{6}{11}\cdot\frac{2}{3}+\frac{5}{11}\cdot .56=.6\overline{18}$

on f1:

r: $1-\left(\frac{1}{3}^2+\frac{1}{2}^2+\frac{1}{6}^2\right)=.6\overline{1}$ l: $1-\left(\frac{1}{5}^2+0+\frac{4}{5}^2\right)=.32$

w: $\frac{6}{11}\cdot .6\overline{1}+\frac{5}{11}\cdot .32=.4\overline{78}$

on f3:

r: $1-\left(\frac{1}{5}^2+\frac{2}{5}^2+\frac{2}{5}^2\right)=.64$ l: $1-\left(\frac{1}{3}^2+\frac{1}{6}^2+\frac{1}{2}^2\right)=.6\overline{1}$

w: $\frac{5}{11}\cdot .64+\frac{6}{11}\cdot .6\overline{1}=.62\overline{4}$

Step 1:

Gini on f0:

r: 1 1: $1-\left(0+\frac{3}{8}^2+\frac{5}{8}^2\right)=.46875$

w: $.8 \cdot 1 + 1 \cdot .46875 = .46875$

☆ on f1:

r: $1-\left(\frac{3}{4}^2+\frac{1}{4}^2\right)=.375$ 1: 0

w: $\frac{1}{2} \cdot .375 + 0 = .1875$

on f2:

r: $1-\left(\frac{1}{2}^2+\frac{1}{2}^2\right)=.5$ 1: $1-\left(\frac{1}{4}^2+\frac{3}{4}^2\right)=.375$

w: $\frac{1}{2} \cdot .5 + \frac{1}{2} \cdot .375 = .4375$

on f3

r: $1-\left(\frac{1}{2}^2+\frac{1}{2}^2\right)=.5$ 1: $1-\left(\frac{1}{4}^2+\frac{3}{4}^2\right)=.375$

w: .4375

subroot set

1	0	1	1	1
1	0	1	0	1
1	0	1	1	0
2	0	1	0	0
2	0	0	1	1
2	0	0	0	1
2	0	0	1	0
2	0	0	0	0

Step 2:

Gini on f0:

r: 1 1: $1-\left(\frac{3}{4}^2+\frac{1}{4}^2\right)=.375$

w: .375

☆ on f1

r: $1-\left(\frac{3}{4}^2+\frac{1}{4}^2\right)=.375$ 1: 1

w: .375

on f2

r: $1-(1^2+0)=0$ 1: $1-\left(\frac{1}{2}^2+\frac{1}{2}^2\right)=.5$

w: $\frac{1}{2} \cdot 0 + \frac{1}{2} \cdot \frac{1}{2} = .25$

☆ on f3

r: $1-(1^2+0)=0$ 1: $1-\left(\frac{1}{2}^2+\frac{1}{2}^2\right)=.5$

w: .25

subroot set

1	0	1	1	1
1	0	1	0	1
1	0	1	1	0
2	0	1	0	0

Step 4: set

1	0	1	0	1
2	0	1	0	0

on f0:

r: 1 1: $1-\frac{1}{2}^2-\frac{1}{2}^2=\frac{1}{2}$

w: $\frac{1}{4}$

on f1: w: $\frac{1}{4}$

on f2: w: $\frac{1}{4}$

☆ on f3

r: $1-1^2-0^2=0$ 1: $1-0^2-1^2=0$

w: 0