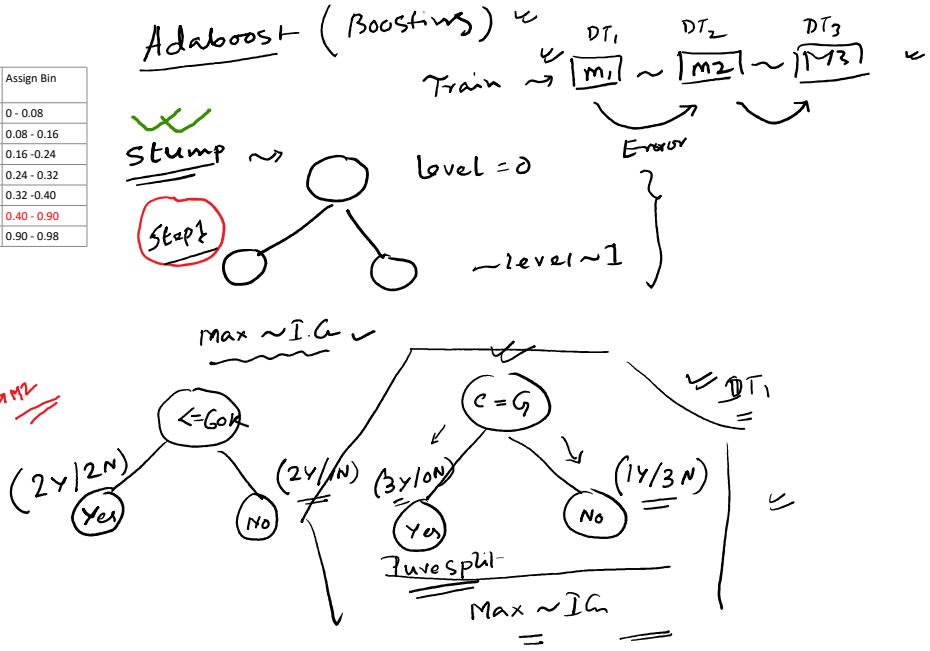
Adaboost Step By Step Explanation

Monday, May 15, 2023 6:07 PM

Salary	Credit	Approval	Sample Weight	Updated Weight	Normalized Value	Assign Bin
<=60K	BAD	NO	1/7	0.058	0.083	0 - 0.08
<=60K	GOOD	YES	1/7	0.058	0.083	0.08 - 0.16
<=60K	GOOD	YES	1/7	0.058	0.083	0.16 -0.24
>60K	BAD	NO	1/7	0.058	0.083	0.24 - 0.32
>60K	GOOD	YES	1/7	0.058	0.083	0.32 -0.40
>60K	N/A	YES	1/7	0.349	0.501	0.40 - 0.90
<=60K	N/A	NO	1/7	0.058	0.083	0.90 - 0.98

0.677

Random Number Between 0 And 1	Salary	Credit	Approval
0.5	>60K	N/A	YES
0.1	<=60K	GOOD	YES
0.6	>60K	N/A	YES
0.75	>60K	N/A	YES
0.24			
0.32			
0.87			



Step2

~> We will assign some sample weight to each observation

~> 1/7

~> Sum of Total Errors and performance of the stump

~> How calculate the "Sum of Total Errors" = 1/7

~> Performance of the stump $\alpha_1 = \frac{1}{2}\log_e\left(\frac{1-TE}{TE}\right) = \frac{1}{2}\log 6 = 0.896$

$= 0.896$

$f = \alpha_1(M_1) + \alpha_2(M_2) + \cdots \alpha_n(M_n)$

$= 0.896(M_1) + \cdots$

Step3 ~> Update the weigh for correctly and incorrectly specified observations

For correctly classified observation

= Weight $\times e^{-\text{performance of the stump}}$

$= \frac{1}{7} \times e^{-.896} = 0.058$

For incorrectly classified observation

= Weight $\times e^{\text{performance of the stump}}$

$= \frac{1}{7} \times e^{0.896} = .349$

& assign bin

Step4 Normalized weight calculation and assign bin

$= \frac{0.058}{0.697}$

Step5 → Now model will run a loop and assign random value between (0,1) to each observation. ~~between~~

And model will select max data from Largest Bin.

Final Prediction Test data (<=60k, Gold

DT1 ⇝ DT2 ⇝ DT3 - - - DTn

Yes ⇝ No

$\alpha_1 = 0.896$ $\alpha_2 = 0.650$ $\alpha_3 = 0.240$ - -

$f = 0.896\,(Yes) + 0.65\,(No) + .024\,(Yes) + - .22\,(No)$

$= 1.5(Yes) + 0.5(No)$

Performance of Say Yes = 1.5

" " No = .5