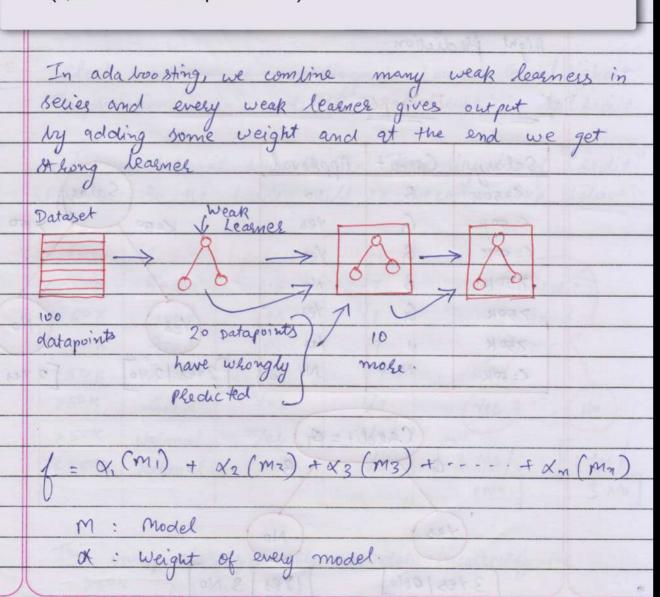
## Machine Learning: ADABOOSTING

- ➤ It is Sequential
- ➤ It Provides computational scalability
- ➤ It is used to exploit / use the dependency between models
- ➤ Stagewise additive multimodeling using Multiclass Exponential Loss Function. (Performance of Stump)
- ➤ Decision Stump : Decision tree created only upto one Depth
- ➤ Ada Boosting can handle missing values and outliers.
- ➤ Ada Boosting can handle mixed predictors as well (Quantitive and qualitative)



=>	weight some poin	8hows	how Atrov	ig the decision thee predict						
	some poin	ut								
=>	If $(\alpha_1)$	Weight i	is high,	this means the model (M1)						
	will tab	e the s	is ponsititi	this means the model (M) by of making the phediction.						
			70.70.70							
=>	If (x) weight is -ve, this means the model (m) is doing no work.									
	+f (x)	vergu i	s -ve, T	us means the moder (1) 43						
	doing m	o work.		The state of the s						
		L SEE MINE	log of the property	Table 18 tab						
	M1,	M2, M3.	Mm -	> Weak Learners						
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=>	weak lear	ness are	the leaks	ers in which decison there is						
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	Ereated only expto 1 De pth. Therefore, it can not give right prediction.									
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1/300	Example DATASET:									
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	Steps	for	Adaboost	a	lgorithm
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/	75°K	вг	tes	1/7				
( Jaselle	750K	H	Yes	1/7	PELLOS MODELE			
303	4=5014	N	No	1/7				
	THE THE	B-1 Wales	A Hode	187 30 0	s. Perlessons			
	( +1		2 0		ofter Atom o			
STEP 1:	Initi alli	ne the	weights a	s 1/m +	o every nob	servations.		
	1-70 x /	2 (3) 5	10		J			
STEP 2:	select	the pea	ture acold	ling to	Lowest Gini /	Highest		
	Information Gain and calculate the Total Elson.							
	The Assert of Constitution of the Constitution							
	In our dataset lowest Gini Impurity is of "Ched							
100	Feature So the table will se become like below.							
	The state of the s							
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ar blackers	750K	Normal	Yes.	- 1/7				
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	This st	ump clas	sified only	one date	a incorrectly i	e.		
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	Because If the Chedit is not good, then Apphoval should
	he No
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=>	So our Total eshos will be [1]
	So our Total eshor will be (1)
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STEP 3	Calculate the Performance of the stump.
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	Performance of the stump = 1 (log (1-tatal error))
	2 ( total error )
	s. Performance of $(d_1) = 1 \log \left(\frac{1-1/7}{1/7}\right)$ the stump $2 \log \left(\frac{1-1/7}{1/7}\right)$
- 9	the stump 2 (1/7)
worthway a	STEPP & That action the Existence of the to enough on wolf
	$= -\frac{1}{\log(6)} = 1.79 \times 1$
rehest	the stump $= \frac{1}{2} \log(6) = 1.79 \times 1$
- 2	di = 0.895
" filesal]	To out dataget when the timpush is af
Step 4	Calculate the new weights for each elassified
	datapoint.
	Calay Cuelt Applace Weighty I say
>	Increase the sample weight for incorrectly co classified
	datapoints
- /	New weight = old weight * e(+x)
(ol)	
	: New weight = 1 * e (0.895)
1/8/1	(For in correctly 7
3 N/O	For in consectly  (For in consectly  classified datapoint)
	New weight = 0.349

						13	KILL			
	bailtera a	MA LA	14- KA 4.	Paperval	Tiboa)	Salassa				
<i>⇒</i>	Decrease the sample weight for correctly classified									
	datapoints.									
	Care General and test and test and the contract of the contrac									
	New weight = old weight * e(-x)									
	See No oces									
	: New weight = 1 * e (-0.875)									
	: New weight = 1 * e (-0.875)  (For correctly  Classified data points)									
	classif	ed data,	points)	70	James	Zegott.				
	D. D. J. Larra		10000	John	destal a	Ter Jun 19	NE.			
Sample	V. Me	w weig	pht = 0	058	ore over	There				
	i'. New weight = 0.058									
Centra uten	So the updated weight will be.									
dieved	number of transer scorters of the anning									
	Salary Credit Apphoval weight Updated weight.									
Smilati	L=50K Bad No 1/7 0.058									
V	L=50K Good Yes 1/7 0.058									
	L=90K Good Yes 117 0.058									
top or	750K Bad No 1/7 0.058									
Hains a	17-									
70 3700.	75014	Nolmal	tes	1/7	6.349	Регист				
	L=50K	Mormal	No	1/7	0.058	ALL SED				
all o	Total 0.697									
	power gets appeared as that									
Step 5	Nohmalise the sample weight:									
	If we add all the updated weights, we get 0:697.									
2 amel 41	Hence, for normalization we divide all the sample									
Jarring 1	weights by 0.697 and then create normalized sample									
art los	weights as shown relow.									
	1 184		The app		U. E.					
				4						

$\overline{}$											
	Solary	Chedit	Apploval	·Updated	Normalized	(1=)(fa					
102/1/201	weight weight.										
	L=50K Bad No 0.058 0.083										
	L=50K Good tes 0.058 0.083										
	L= 50K Good Yes 0.058 0.083										
	750 K Bad No 0:058 0:083										
215/2	750K Good tes 0.058 0.083.										
	750K	Normal	Yes	0.349	0.501						
	L=50K Normal No 0.058 0.083										
	Total 0.897 1										
	These new normalized weight will act as the sample										
	weight for the next iteration.										
step 6											
	think beenly then business these world										
7	Now this will be the output of I decision thee, similarly we will receive output of many decision trees.										
	ive w	ill sece	ive output	of many	decision trees.	U					
	Legel Good Yes 17 0:058										
(2	· Suppose, m trees (stumps) are classifying a person get										
	apphoval yes and n thees (stumps) are classifying a										
	person get approval No, then the performance of										
	the stumps ( m thees and n thees) are added										
	seperately and whichever has the highest value, the										
	person gets approval as that.										
	Step & Macmatic the assumption of the second of the										
r-697.	For example:										
3	The damp	To Ja	t the pe	soformance of	stump is 1.2	and the					
sam ple	per took mo	ance of	n taces	itumo is	0.5 then the	, pinal					
	lesult	will	go in the	favour of	m thees and	d the					
	pertro	person	will get	the approvo	il "yes"						
	lesult will go in the favour of m thees and the perfo person will get the approval "Yes"										