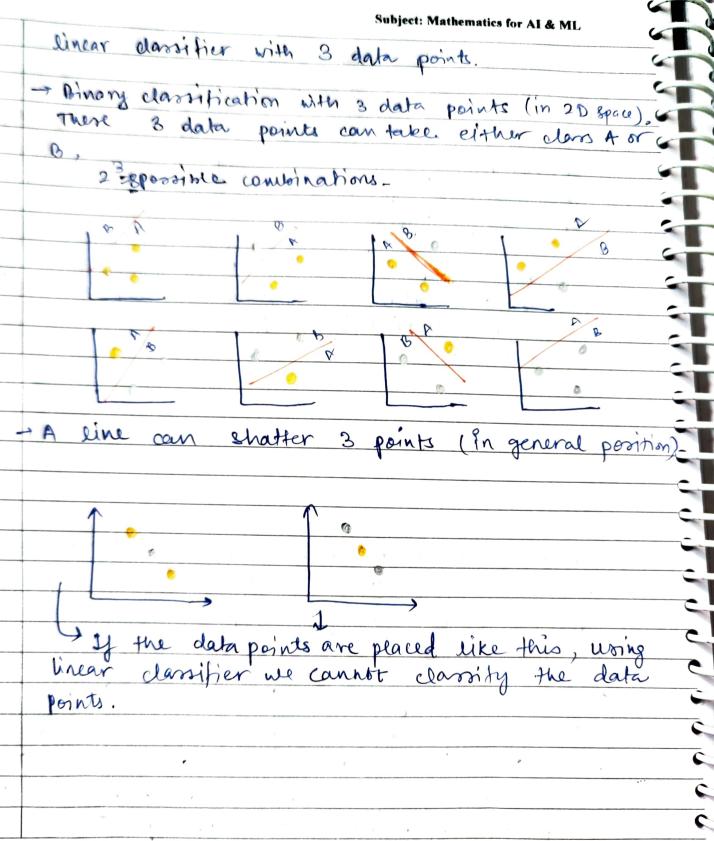


(Approved by AICTE New Delbi & Govt. of Maharashira, Affiliated to University of Mumbal) (Religious Jain Minority)

	Subject: Mathematics for AI & ML
	Supervised Learning -
	Supervised Learning - Vapnik - Chervonenkis (VC) Dimension ->
7	VC dimension is a measure of the capacity
	or complexity of a space of function that can be learned by a classification algorithm more
	be learned by a classification algorithm more
	specifically, hypothesis)
-	The basic definition of NC is the capacity of a classification algorithm, and is defined as the maximum cardinality of points that the algorithm
	classification algorithm, and is defined as the
	maximum caudinality of points that the algorithm
	is able to shatter.
**	Shattering is the ability of a model to classify a set of
	points perfectly.
	linear classifier with two data points->
	-) A binary classifier, first is positive class A' and
	another is negative class 'B'.
	+ possible combinations of data points are 2".
	In our case + 2 & ++, +-, -+,}
	217 9001 22 1 11 1
	() () () () () () () () () ()
	In all the cases, the linear classifier can seperate the positive and negative data points.
	the positive and negative data points.
	· · · · · · · · · · · · · · · · · · ·



(Approved by ARCTE New Boths & Gove, of Mathematica, Adminated to University of Manhal)





(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbal) (Robigious Jain Minority)

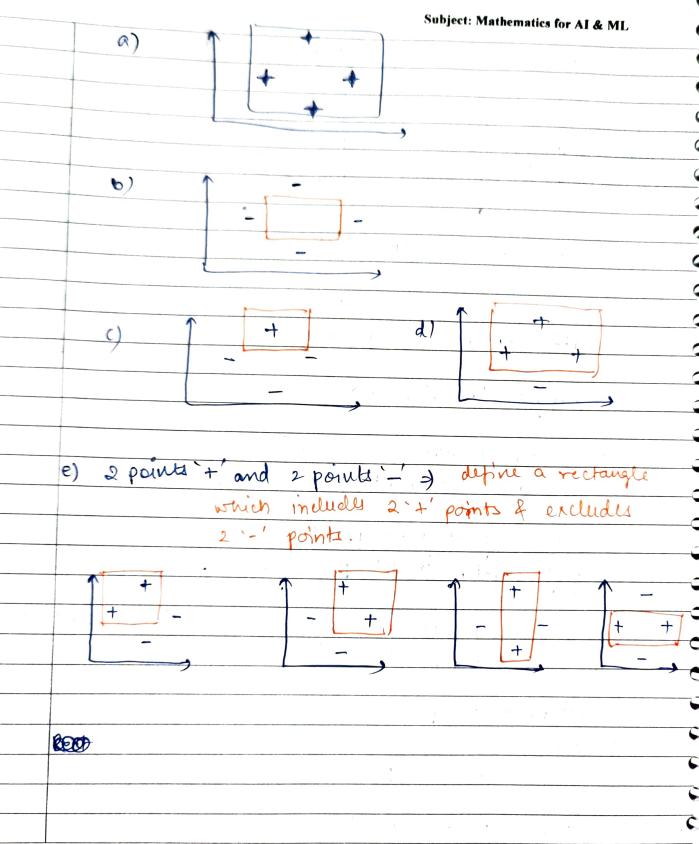
Subject: Mathematics for AI & MI

Subject: Mathematics for Al & ML
linear dassifier with 4 data points_
2 = 16 combinations.
Here, line is unable to shatter the two classes.
so, we can say that the linear classifier can
shattee at most 3 points.
state of the state of
Rectangle Classifier ->
To one come the deawback of linear elassifier, we
will mone to rectangle classifier.
Fin case of 4 data points, lectangle classifier can
early shafter in all possible ways.
earily shaffer in all possible ways. CLASSIFIER > Inside the rectangle > Positive of outside the rect > neg. example
given four points (incarly independent), we have the
to coming will granding.
a) All points are positive '+' => use a rectangle that includes
a) All points are positive '+' => use a rectangle that includes them. b) All points are negative '-' => use a empty rectangle. c) 3 points '-' and 1'+' >> use a rectangle centered on positive points.
a) 3 points'+' and 1'-') we can always find a rectangle which excludes the - points.

OUR



(Approved by AICTE New Dollhi & Government Affiliated in University of Manuscript, Aff





1

(Approved by AICIT New Bolls! & Gov., of Maharashira, Affiliated to University of Mumbal)

Subject: Mathematics for AI & ML

	•
	Rechangee classifier with I data points:
	Rechangle dorseigles
	and white home.
	25 = 132 combinations:
	ilia on All data point
	if all data points are positive of the days points
	if all data points are positive or All data points are negative, we can easily classify.
1	
-	+ + +
	+ + +
-	
	To this case using a diectangular
	+ - + > classifier we can not classify
	+ - + - Carpaper we continue
	it.
	The second of th
	Vaprik - Cheevonerkis dimensions (VC dimension)
	- A dataset containing N points.
	- these N points can be labeled in 2 ways on
	Positive of Magazline
	positive or negative.
	A humble is half to constell the oppitive
,	A hypothesis h EH that separates the positive examples from the negative, then we say
	examples from the negative, we say
,	H shatters N points.
	the state of the s



(Approved by ArCTE New Delhi & Govi. of Maharashtra, Affiliated to University of Mumbal) (Religious Jain Minority)

Subject: Mathematics for AI & ML

The maximum no. of points that can be shattered by the scalled the Vapnik-Chervonenking (VC) dimension of the sea denoted as VC(H), and measures the capacity of H.