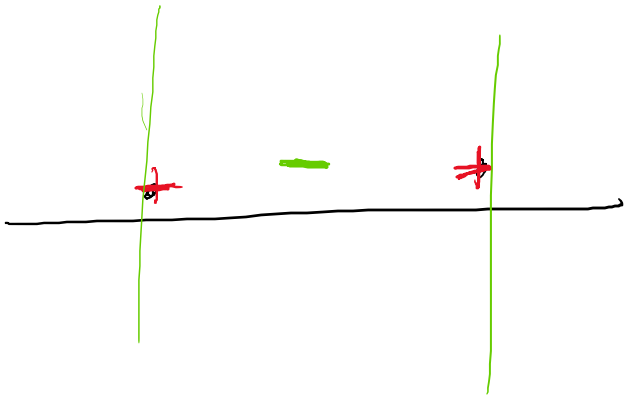
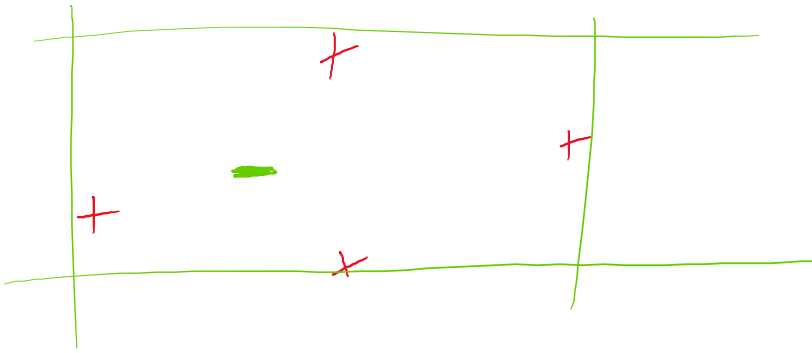
For 1 Dimension Cylinder splits in 2 space

VC dimention is 2

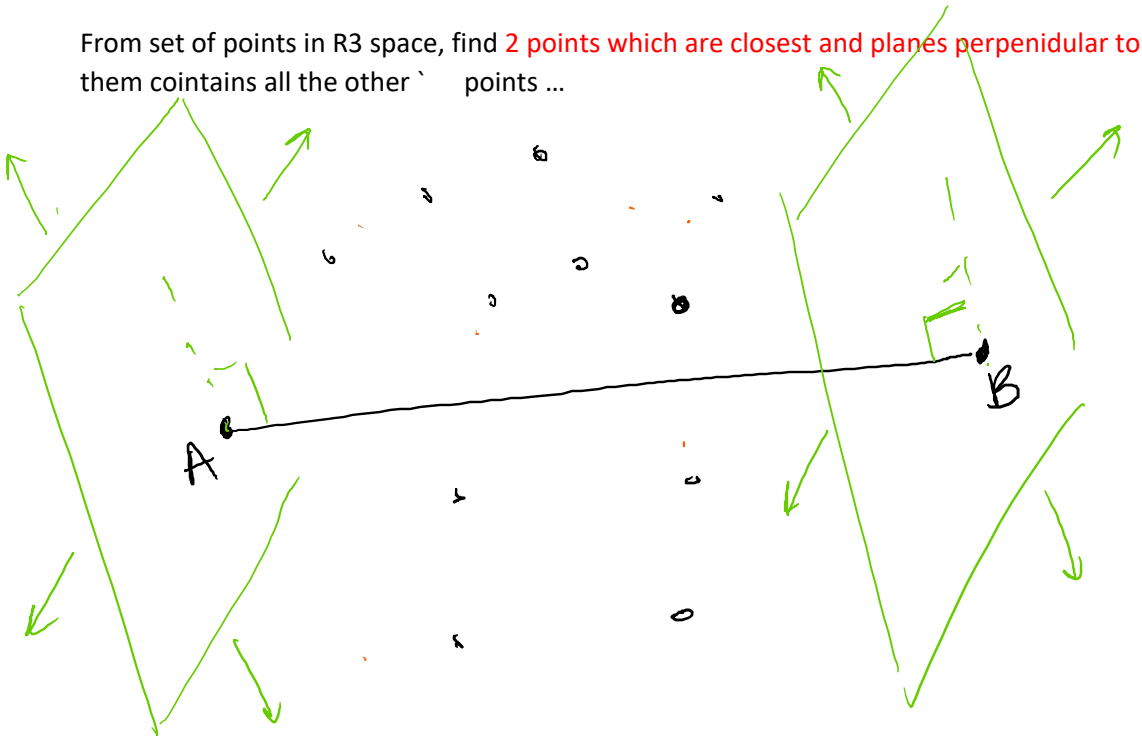
3 points cant be shatterd



For 2 D, Cylinder forms a rectangle.
VC dimention is 4 ,as it cannot shatter 5 points.

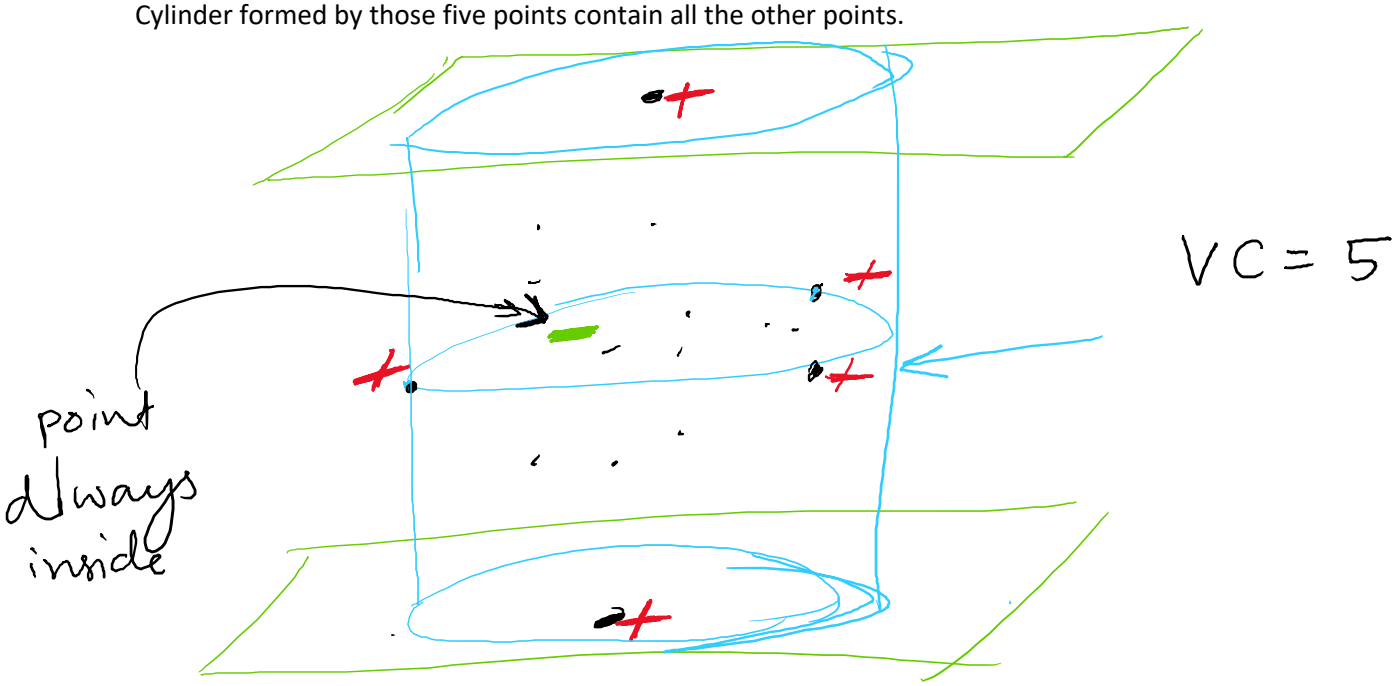


From set of points in R3 space, find 2 points which are closest and planes perpenidular to the line joining them cointains all the other ` points …



- For a circular curved surface perpendicular to those those two planes there would be three points which line on the circle and contain all other points in the cylinder (3 points are required to form a circle).
  The curved surface by those 3 points of circle contain all the other points.

  Cylinder formed by those five points contain all the other points.



Q1 a

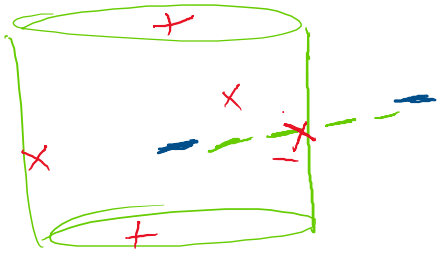
$VC = 5$

$$M \geq \frac{1}{\epsilon}\sqrt{4\ln\left(\frac{2}{\delta}\right) + 8\,VC(H)\cdot 1\ 3}$$

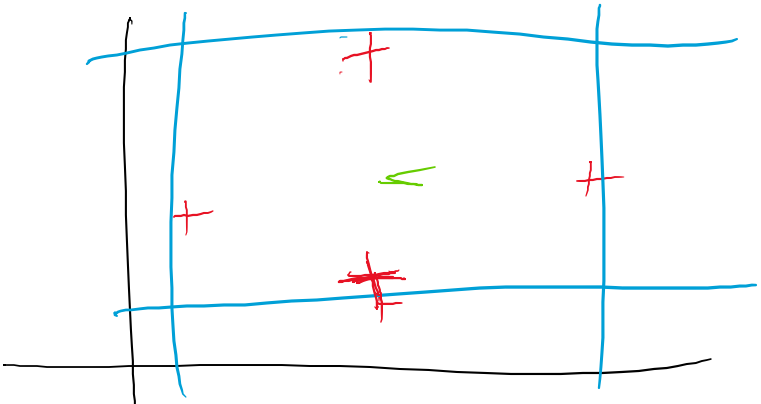
$\epsilon = 0.2 \qquad \delta = 0.5$

$M \geq 67.4 \qquad \boxed{M \geq 68}$

b.) If cylinder with points inside as -ve can be classified .
VC dimenstion turns to 6 .



2.)For any set of points there can be a rectangle formed by four points which contain the fifth



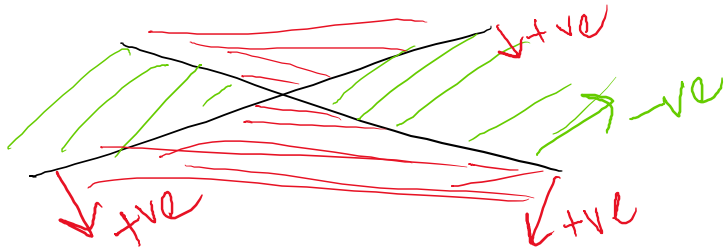
For any points less like 3, remove the -ve points , find the rectangle of plus points, since it is the tight rectangle it wont contain any other point so the -ve point wont be inside.

3)

For linear one fixed linear , it only create one case, but a point can be in two case for binary.

Two fixed linear separator creates 2 possible case. Since those classifiers are distinct. For set of two there would be region where one make -ve and the other +ve. So There will always be region <u>where one point</u> can be classified always.

2 points form 4 cases

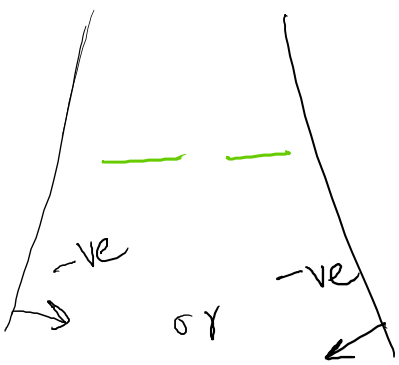


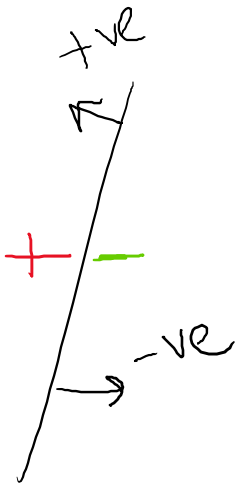
- Can't be shatterd by set of classifier who has only 2 cases.(VC =1 max) also.

For K=3 as well it creates only

3 cases

F 3 linear classifer also can only make





For 4 points it require atleast 4 distinct classifier so it cant be shatter by 3 distinct classifer.
Max VC =1 ,
And min VC=1