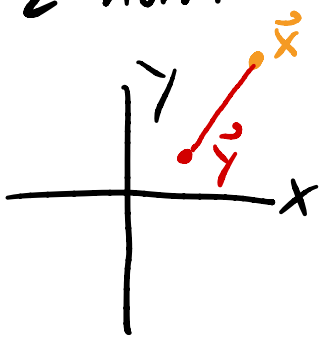
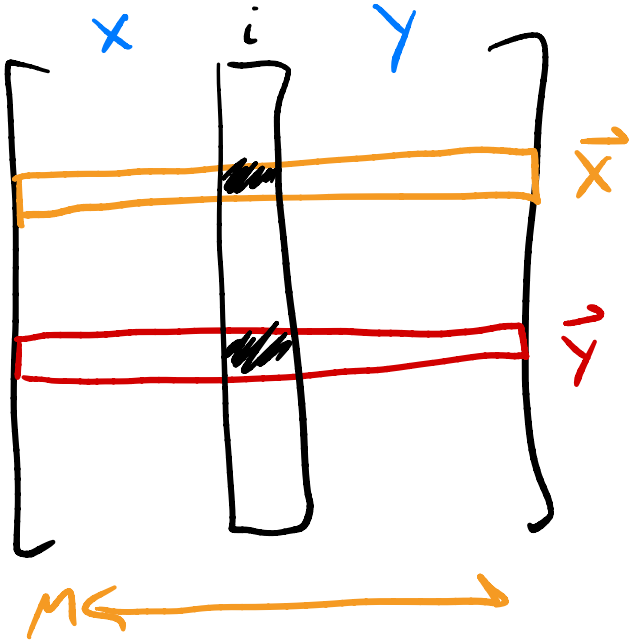
Lecture 21

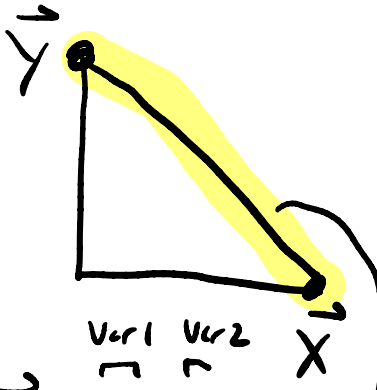
Euclidean distance: "L^2 norm" ← "elle 2 norm"



$A =$



How far apart are $\vec{x}$ and $\vec{y}$?



Var1 Var2

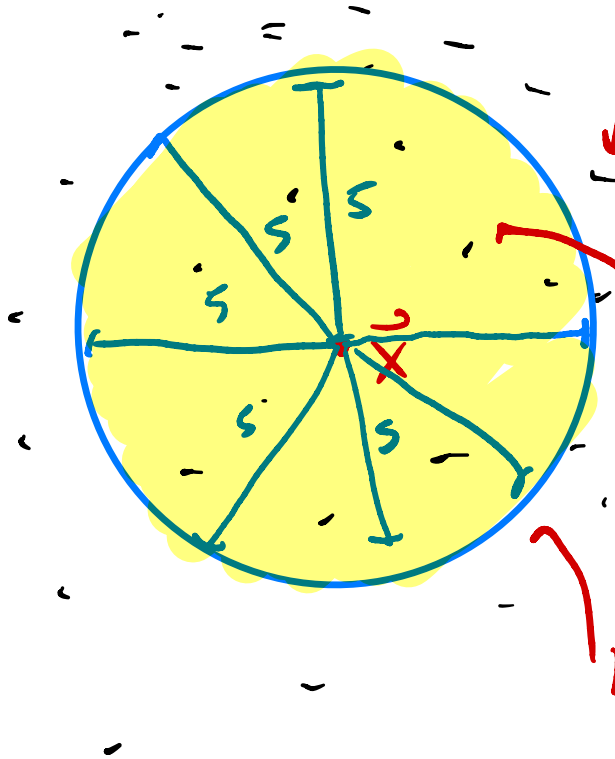
$\vec{x} = (x_1, y_1)$

$\vec{y} = (x_2, y_2)$

$$d(\vec{x}, \vec{y}) = \sqrt{\sum_{i=1}^{M} (x_i - y_i)^2}$$

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Straight line distance — "as the crow flies distance"



$\vec{x}$: you are in my cluster if your L^2 distance is less than 5.

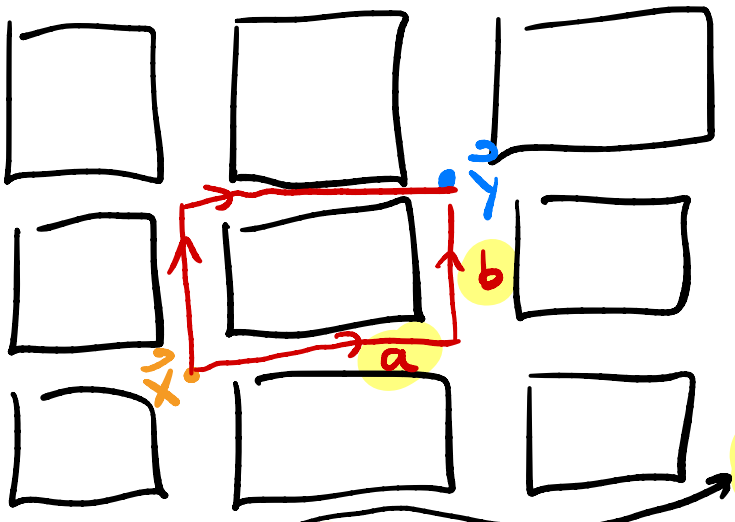
not in $\vec{x}$'s cluster

everything in here is.

neighborhood : L^2 distance
Circular neighborhood.

Advantage: geometry is intuitive.

L^1 norm / distance: Manhatten distance
City block distance



$\vec{x}: (x_1, y_1)$

$\vec{y} = (x_2, y_2)$

$a = |x_1 - x_2|$

$b = |x_2 - y_2|$

$d(\vec{x}, \vec{y}) = ? = a + b =$

$$d(\vec{x}, \vec{y}) = \sum_{i=1}^{n} |x_i - y_i|$$

↙ absolute value