**Machine Learning : Perceptron 2**

**Decision Boundary**

* Decision boundary is where sign(a) changes from -1 to +1
* Set of points x where a = 0
* Assume bias b = 0

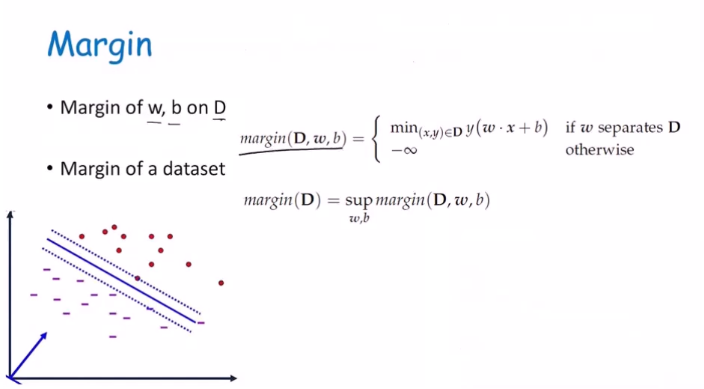
**Dot products**

**Linearly Separable**

* If the classes can be separated by a hyperplane, then they are linearly separable.
* Perceptron can learn any linearly separable function.
* If the problem is not linearly separable the perceptron will never converge.

**Margin**

* Margin = distance between decision boundary specifically the hyperplane and the nearest point
* Large margin -> easy
* Small margin -> hard



* sup = max but handles negative infinity differently

**Perceptron Pros and Cons**

* **Pros**
  + Simple
  + Classification & regression
  + Can handle numeric data.
* **Cons**
  + Can **only** handle numeric data.
  + Linearly separable only
  + May not converge quickly.