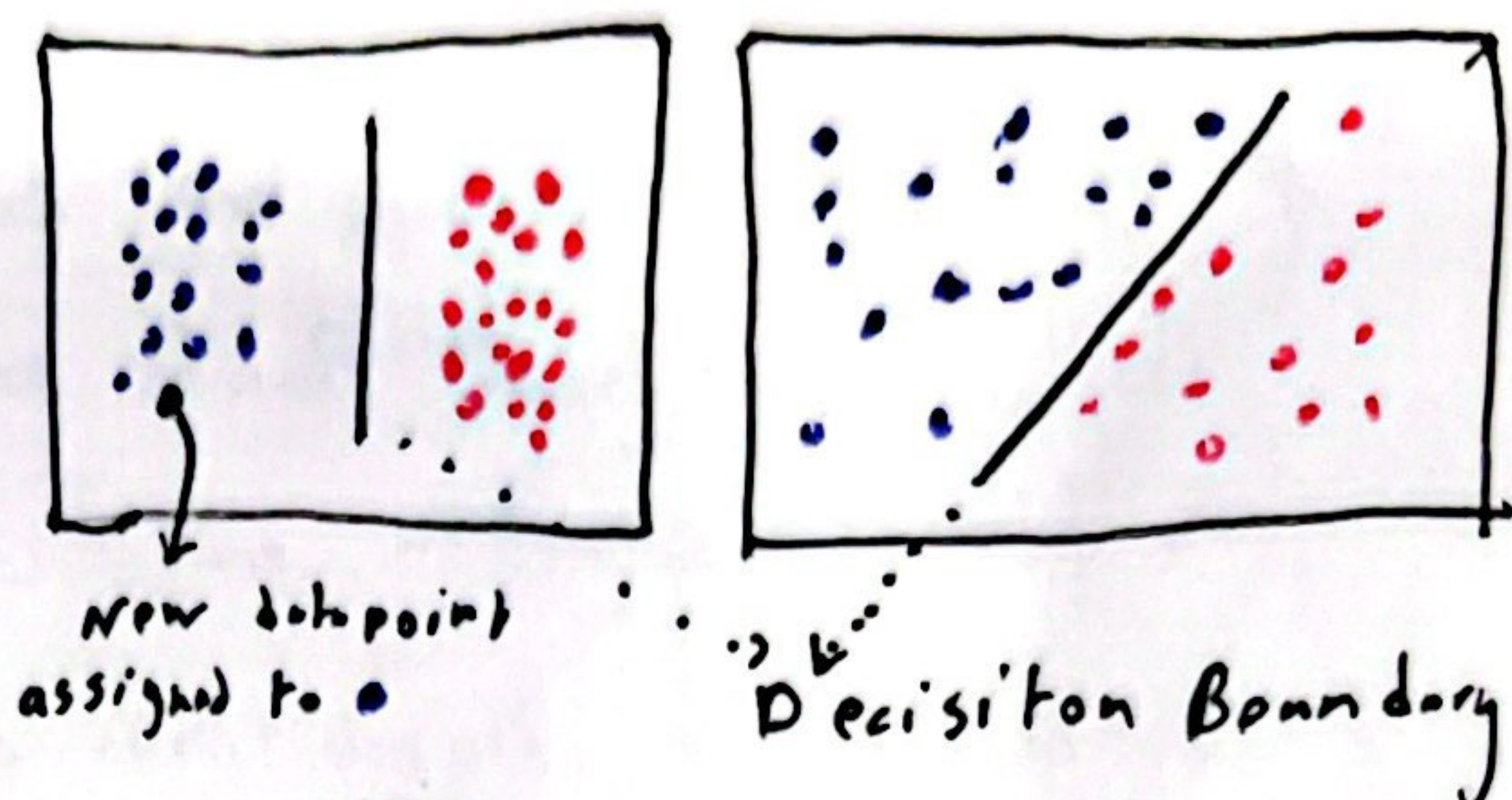


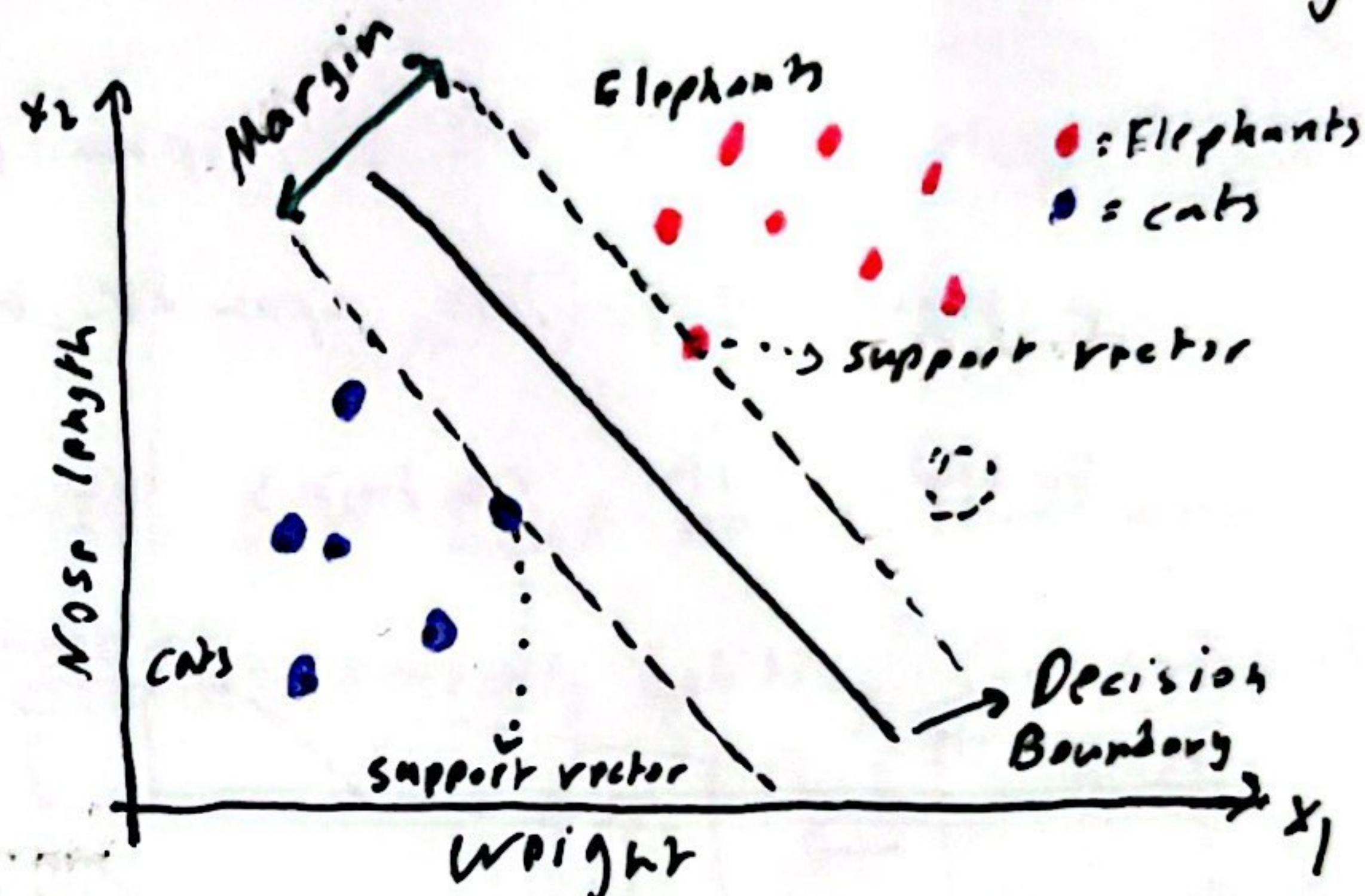
Support Vector Machine (SVM) (- supervised learn) - classification - Regression

1 - The core concept of the algorithm is to draw a decision Boundary Between data points that separates data points of the training dataset as well as possible

2 * unlike KNN a new data point is assigned to the side of the boundary it falls on the nearest labels do not matter



3 * Ex: lets try to classify animals based weight and len of nose in this case the Decision Boundary is straight the SVM tries to find the line that separates classes with largest margin possible it maximize space between classes this helps it generalize well to new data, reduce noise and prevent outliers



4 * The support Vectors are the datapoints that sit on the edge of the margin knowing the SV is enough to classify new datapoints which makes it memory efficient

5 - if New data point assigned to its class based on the decision boundary
(;) \Rightarrow would be classified as Elephant

6 * One Benefit of SVM is that it's powerful in high dimensions if the # of features is large compared to the data in those cases the decision boundary is complex and called a hyper plane

Kernel functions

7 - another feature of SVM is the use of kernel functions which allow for identification of complex non-linear decision boundaries

Kernel Functions are a implicit way to turn original features into new complex features using kernel trick, basically make new features for a non-linear boundary this is called implicit feature engineering. NN also do this

Possible kernel functions for SVM

- Dot product
- RBF
- sigmoid
- polynomial

* Kernel functions Example
= Non linear Decision Boundary

