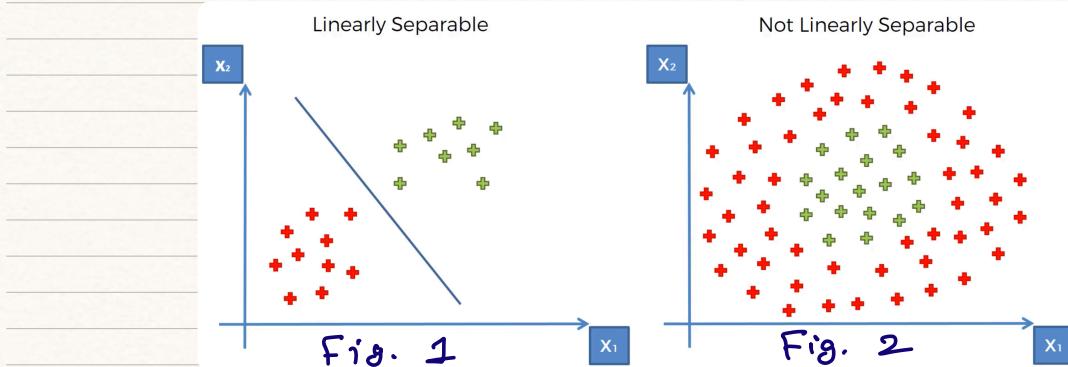


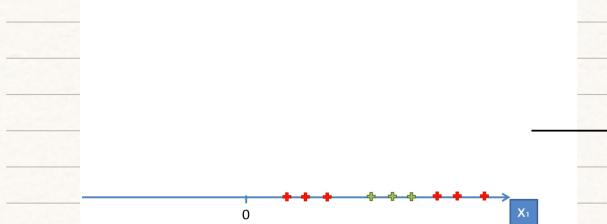
## kernel SVM



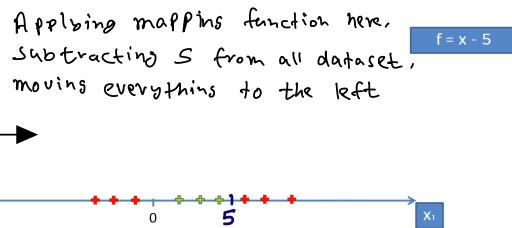
In Figure 1, we can easily find the decision boundary because the data is linearly separable, but it is not possible in figure 2, as data is not linearly separable.

One way to solve this problem is mapping the data into higher dimension.

### Mapping to a Higher Dimension

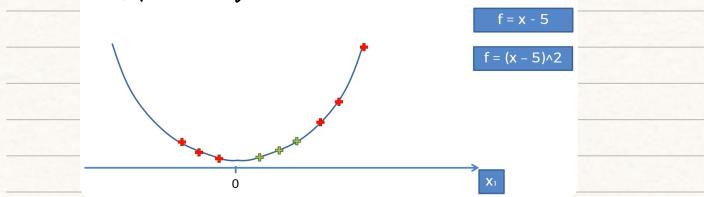


### Mapping to a Higher Dimension



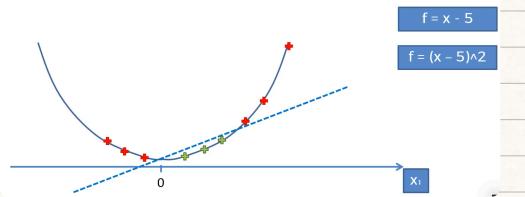
### Mapping to a Higher Dimension

Applying square root function.



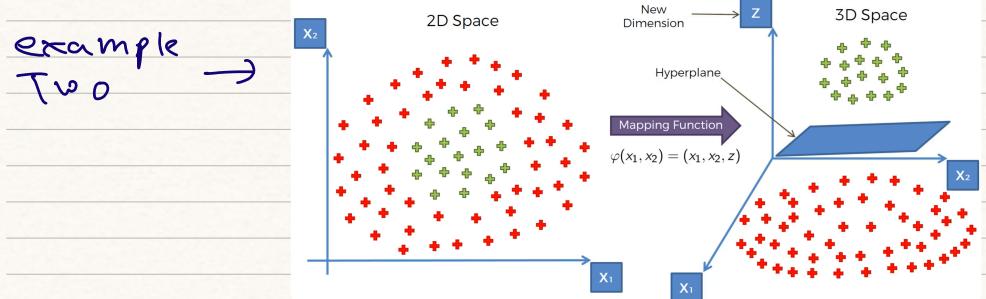
### Mapping to a Higher Dimension

Now data became linearly separable.



### Mapping to a Higher Dimension

example  
Two →

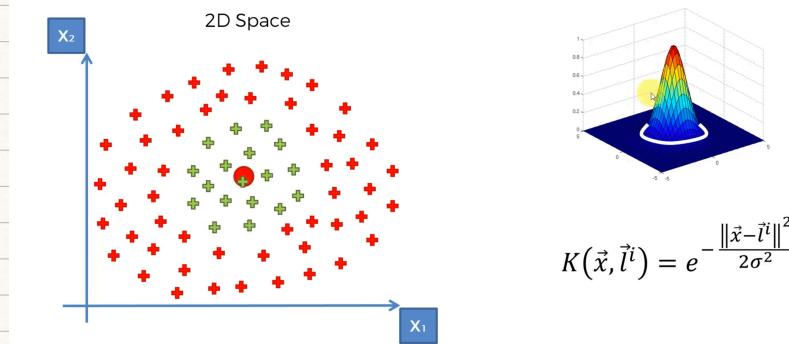


The problem with this approach is that, moving to the higher dimensional space can be highly compute-intensive. Larger the dataset, more problem it may cause.

The solution is using The Kernel Trick. It gives very similar results without going to the higher dimensional space.

The kernel function takes input of low dimensional feature space and converts it into high dimensional feature space.

## The Gaussian RBF Kernel



## Types of Kernel Functions

