

**Solution:** The answer to the following question:

- (i) Linear Kernel with  $C = 1$ : Figure (b)
- (ii) Linear Kernel with  $C = 10$ : Figure (f)
- (iii) Linear Kernel with  $C = 0.1$ : Figure (c)
- (iv) RBF Kernel with  $k = 1$ ,  $C = 3$ : Figure (e)
- (v) RBF Kernel with  $k = 0.1$ ,  $C = 15$ : Figure (d)
- (vi) RBF Kernel with  $k = 10$ ,  $C = 1$ : Figure (a)

The Linear kernel makes a linear decision boundary.

Reason, The more the value of  $C$  the tighter the boundary gets without giving any relaxation to the points and it becomes a hard margin classifier and perfectly classifies the data without allowing any slackness.

The Gaussian kernel makes a curve decision boundary

Thus, if the  $k$  is very large, only the points within a certain distance can affect the predicting point. In other words, larger  $k$  tends to make a local classifier, smaller  $k$  tends to make a much more general classifier.