3. (12 points) [SVM'S TO THE RESCUE] A Gaussian or Radial Basis Function (RBF) kernel with inverse width $k > 0$ is

$$K(u, v) = e^{-k||u-v||^2}.$$

The below figures show decision boundaries and margins for SVMs learned on the exact same dataset. The parameters used for the different runs are as follows:

(i) Linear Kernel with C = 1

(ii) Linear Kernel with C = 10

(iii) Linear Kernel with C = 0.1

(iv) RBF Kernel with $k = 1$, C = 3

(v) RBF Kernel with $k = 0.1$, C = 15

(vi) RBF Kernel with $k = 10$, C = 1

Find out which figure plot would have resulted after each run mentioned above. Justify your answer.

In these plots, circles are Class 1, triangles are Class 2, and solid points are support vectors.

SVM Images/fig1.PNG

SVM Images/fig2.PNG