2018 Fall, Database Project, HW3

Submission: You should submit your report and the MATLAB code by Nov. 29th PM11:59 (upload them on the icampus).

Late Policy: We accept late submissions until Nov. 30th AM11:59 with 50% points reduction.

1. Implement the K-means clustering algorithm using MATLAB. Your function should have the following function prototype.

Function prototype:

- Input: k, initial centers, X

- Output: cluster label

  (1) Visualize the clustering results on the given data matrix X.mat. Set k=5, and use a different color for each cluster. Also visualize the center of each cluster in the plot.

  (2) Plot the K-means objective function value vs. the number of iterations.

2. Implement the kernel K-means clustering algorithm using MATLAB. Set k=2 and use the Gaussian RBF kernel. Visualize the clustering results on the given data matrix Y.mat. Use a different color for each cluster. Describe what value you used for the parameter c for the Gaussian RBF kernel. Your function should have the following function prototype.

Function prototype:

- Input: k, initial centers, c, Y

- Output: cluster label

 (1) Draw a plot which has x_1 for the x axis and x_2 for the y axis.

 (2) Draw a plot which has $x_1^2 - x_1$ for the x axis and $x_2^2 - x_2$ for the y axis.