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CS 349 HW #3 Free Response Questions

1. When beta from soft k-means approaches infinity, the bell curve gets infinitely "squashed" into a horizontal line. This means that every point has an equally low (basically zero) chance of belonging to each cluster, rendering the classification method useless. This is the opposite of what happens in hard k-means, where beta equals zero and each point is assigned a fixed centroid, only the one that has the closest distance.
2. The attached data can be better clustered using GMM than k-means because of the elliptical shape of the clusters. With k-means, the clusters can only be circular, but with GMM they can be elliptical because GMM considers covariance. The covariance type one chooses when using GMM gives the user greater freedom in clustering data points that are not perfectly circular.