**Applied Machine Learning Assignment**

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**1. Write a few sentence Write a few sentences with your thoughts on these results. Are they what you expected? Did you think that within-group sum of squares and mistake rate would go up or decrease as *k* increased? Did the plots confirm your expectations?**

I think that if k increase, then the distortion and mistake rate value will be decreased. I expected it will decrease drastically at first and then it will decrease little by little. So I tested three cases. The values of k were tested up to 10, 30, and 100 respectively, and the results were same with my expectation. As the k value increases, the distortion and mistake rate decrease, but as the k increases, the computation amount and various disadvantages exist, so it seems important to find the appropriate k value.

When I searched, there was an elbow method that can find the appropriate k value. There is a part where the shape of the graph is bent like an elbow, and that part is an appropriate k value. In addition to the elbow method, there are RMSLE and Silhouette methods, so it is necessary to find an appropriate k using a method that fits the situation.

I attatch two result of my code. (k = 1~10, k = 1~30)



