

1. Clustering is considered what type of learning? Supervised, semi-supervised, unsupervised, or reinforcement? Circle one and explain. (2 points)

2. K-Means will always converge to the same cluster centers. True or false. Circle one and explain. (2 points)

3. How are K-Means and K-NN similar in the way they use features? (2 points)

4. Answer the following questions given the data below. The features are in 1D.
 $s_1 = -4$
 $s_2 = -3$
 $s_3 = -1$
 $s_4 = 0$
 $s_5 = 2$
 $s_6 = 3$
 $s_7 = 4$
 - (a) Use K-Means with $K=2$ to cluster the data. Start with $\mu_1 = -2$ and $\mu_2 = 1$. What are your final clusters, C_1 and C_2 ? (3 points)

 - (b) How would you classify the following test point with your clusters above? $s_t = 1$. (1 point)

1. Clustering is considered what type of learning? Supervised, semi-supervised, unsupervised, or reinforcement? Circle one and explain. (2 points)

2. K-Means will always converge. True or false? Circle one. (1 point)

3. The K in K-Means is a parameter that is determined by the training data. True or false. Circle one and explain. (2 points)

4. Answer the following questions given the data below. The features are in 1D.
 $s_1 = -4$
 $s_2 = -3$
 $s_3 = -1$
 $s_4 = 0$
 $s_5 = 2$
 $s_6 = 3$
 $s_7 = 4$
 - (a) Use K-Means with $K=3$ to cluster the data. Start with $\mu_1 = 2$ and $\mu_2 = 3$, and $\mu_3 = 4$. What are your final clusters, C_1 and C_2 ? (4 points)

 - (b) Is this the best clustering you think could have been achieved with K-Means? Explain. (1 point)