**Homework 1**

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**Q1**

Based on the given data, the three points with the smallest L2 distance are:

If , then the point chosen to decide the class of the test data might be A1 or C2, so the test data might be classified to be A or C under same probabilities.

If , the two points will be A1 and C2, which means the test data will be classified in A and C with same probabilities.

If , all the three points will be chosen to decide the class, so the test data will be classified to be A.

**Q2**

The following picture shows the distribution of the training and test data, in which round and triangle represent training and test data respectively. The value of k is set to be 10.

图表, 散点图

描述已自动生成

**Q3**

All the input are 2828 images, so I first convert them into 1-D arrays. Using the code in Q2, I finished the training process. I chose the test data from 500 to 550 as the test set. The result is shown below with accuracy as 0.98 and execution time as 17.4 seconds.

