RECORD THE RESULTS OF THE EXPERIMENT IN THE TABLE BELOW

| Trial | Epochs To Converge | |
	Low Similarity	High Similarity
1	3863	4018
2	3863	4018
3	3863	4018
4	3863	4018
5	3863	4018
6	3863	4018
7	3863	4018
8	3863	4018
9	3863	4018
10	3863	4018
Mean	3863	4018
Variance	0	0

EXERCISE 7.1

1. **What are the independent and dependent variables for this experiment?**

The independent variable is the amount of similarity between items being associated. The dependent variable is the number of epochs of training required for the network to learn the associations.

2. **By examining the means in the table above, what can be concluded about the effects of the independent variable? Use appropriate statistical tests to support this conclusion.**

It can be concluded that the low similarity condition leads to a small, but statistically significant, improvement in learning. That is, the low similarity associations are learned faster than the high similarity associations. (Because there is 0 variability, you can make this claim because the distributions do not overlap. A nonparametric statistical test, like the sign test, would also lead to this conclusion.)

3. **From the brief description of some of the human results for the paired associate task that was given earlier in the chapter, would you conclude that the distributed associative memory is generating human-like results, or not?**

Some of the results of Dallett (1966) are replicated, because it was found that increasing within-list similarity slowed learning down.

4. **What is the variance of the results for each condition? Why is this the case, and what are the implications for performing this kind of experiment?**

The variance of the results for each condition is 0. This is because all of the networks start with zero weights, and have the same pattern of learning conducted, which leads to identical learning results. The implication for the experiment is that it makes statistical comparisons difficult. Also, it isn't a very realistic simulation, in the sense that every simulated subject is identical to one another.

5. **Speculate on how the experimental methodology in this exercise could be modified to increase the variability in each column of data. Do not feel constrained by the James program – perhaps your proposed change in methodology would require some minor modifications to the program itself.**

One could improve the experiment by changing the James program in such a way that random noise was added to the weights prior to the start of learning. In this way, variability would be expected in terms of the number of sweeps required to completely learn the associations.

6. **When the Hebb rule is used to train this kind of memory, what is the relationship between the training of the network and the two methods used to teach paired-associates to humans (i.e., the alternate study and recall method and the anticipation method)?**

When the Hebb rule is learned, it is as if the network is being taught using the alternate study and recall method, because the network is not getting much feedback about its performance.

7. **When the delta rule is used to train this kind of memory, what is the relationship between the training of the network and the two methods used to teach paired-associates to humans (i.e., the alternate study and recall method and the anticipation method)?**

When the delta rule is used to train this kind of memory, the network is learning as if the anticipation method is being used, because the network is given the kind of feedback about its performance that could be used to change its weights that would be provided by this method of learning.