Linear discriminant analysis

Data file LDA-DataX.txt contains all data required for the whole laboratory exercise. First and second column are two dimensions of training data set. The third and fourth column are two dimensions of testing data set. The last column relates to training/testing data class labels.

1. For the given training data set and their class labels, find linear discriminant function weights utilizing the **perceptron criterion** algorithm. Assume learning rate $\sigma = 0.25$. When learning is finished (all training data are classified properly or the maximal number of iteration is achieved):
   - write down the number of iterations,
   - show the linear discriminant function and training data set,
   - calculate and write down the training accuracy as the percentage number of correctly classified training data,
   - perform classification of the testing data set, calculate and write down the testing accuracy.

2. Repeat task 1) but instead of perceptron criterion, utilize the **relaxation** algorithm. Assume $\sigma = 0.1$ and $B = 0.5$.

3. Perform necessary calculations to obtain classic **Fisher's linear discriminant analysis**.