Requirements:

- Discuss with your colleagues and help each other;
- Complete the report independently;
- The key of the following problems is a mathematical formulation. Therefore, you should answer these questions based on a mathematical equation instead of textural description;
- Note that: JMLR2003 is a journal extension of Science2000, which provides more details and you should pay more attention on this paper.
- Deadline: 22:30, Nov. 11 2017

1. Summary Notations in tables. The order should be in Alphabet, and you are encouraged to summary variables, vectors, matrix, and others are summarized into different tables. ~~thus, I could be easy to find who misses some notations.
2. explain ``Locally'' in the context of locally linear embedding in mathematics. This means you should find which part of the objective function of LLE reflect locally.
3. explain ``linear'' in the context of locally linear embedding in mathematics.
4. explain ``embedding in the context of locally linear embedding in mathematics.
5. The assumption of LLE
6. The problems to be solved by LLE
7. The limitations of LLE
8. Can you explain the difference between PCA and LLE? (by comparing their objective functions, motivation, and problem to be addressed). What advantages of LLE over PCA?
9. Experimental results on mnist (used in the previous reports).
    a) You should perform LLE on the training data and testing data independently.
    b) After reducing the dim, perform K-nearest neighbor classifier (k=1) on the features to compute the classification accuracy
    c) You should also investigate the influence of parameters of LLE. First, you should find what are the user-specified parameters of LLE? And then assign different values to these parameters and report the corresponding classification accuracy; To be exact, you should change the value of one parameter and fix the others. Try to analyze the result.
    d) Compare LLE with PCA on classification task and 2-d visualization.