1. In LaTex

2. In English

3.summary (in alphabets) the mathematical notations used throughout the paper in a Table, e.g.

Column1, notation，	Column2 definition	column3 corresponding to
(e.g.)x，	single variable	a component/dimension/feature(if non-existing, fill with NA)

4. Some points should be included in your report and try your best to give mathematical explanations.

0. What is the essence of matrix?
1. What problems to be addressed by PCA? (according to the example given in Fig 1)
2. The assumption and limits of PCA. Pls given mathematical instead of textual explanation. i.e., please use mathematical language to explain Section E.
3. What is the basis in linear algebra? Please give an intuitive explanation.
4. What are represented by the covariance? The relations between covariance, redundancy, and noise.
5. Give the definition of SNR, variance, and redundancy, and their relations.
6. What is the meaning of principle component?
7. Pls explain PCA with basis transformation.
8. What is the way to re-express inputs by PCA?
9. What are relations between PCA and covariance matrix?
10. What are the relations between PCA, eigen decomposition (ED), and SVD.
11. The intuitive explanation of ED and SVD.
12. What is the objective function of PCA?
13. Why the objective function of PCA can make sense to dimension reduction?
14. Experimental results:
    a. Perform experiments on the handwritten digital database MNIST（http://www.cad.zju.edu.cn/home/dengcai/Data/MLData.html(
    b. Reduce the dimension of the data set (The first 2k training images and first 2k test images, respectively) to 2D. pls use different colors or shapes to denote different classes.
    c. Give some explanations to obtained results. Try to analyze your results.

5. one week is given. Please submit your report to **** before 21:00 Saturday. NO report will be handled if you submit the report after the ddl.