提醒：基本功能+報告品質普通=基本分數。欲得高分者應思考充實作業成果之各項可能作法。

Homework-2 (Chapter 7. Ensemble Learning)
This is a **Multiclass Classification** homework.

Part 1: The MNIST dataset

1. Load the MNIST dataset, and split it into a training set, a validation set, and a test set: 50,000 instances for training, 10,000 for validation, and 10,000 for testing.
2. Then train various classifiers: E.g. one Random Forest classifier, one Extra-Trees classifier, and one SVM classifier, etc.
3. Next, try to combine these classifiers into an ensemble that outperforms each individual classifier on the validation set, using soft voting. Once you have found one, try it on the test set. Discuss how much better does the ensemble perform compared to the individual classifiers.
4. (Bonus) Try to find other ensemble learning methods to further improve the performance.

Part 2: The Fashion MNIST dataset

1. Use the individual classifiers and the same ensemble for the Fashion MNIST dataset and discuss about the performance.
2. (Bonus) Try to find other ensemble learning methods to further improve the performance.

Part 3: Writing a report

1. Write a report within 10 pages discussing your findings. (ID and names of the group members should be listed on the cover page. Please do not include any code in the report)
2. Please upload your report on Moodle.