What to do ⅓ - Linear SVM

1. Load ***Iris*** dataset
2. Simply select the first two dimensions (let's skip PCA this time)
3. Randomly split data into train, validation and test sets in proportion 5:2:3
4. For **C** from **10^{-3} to 10^3**: *(multiplying at each step by 10)*
    a. Train a **linear** SVM on the training set.
    b. Plot the data and the decision boundaries
    c. Evaluate the method on the validation set
5. Plot a graph showing how the accuracy on the validation set varies when changing **C**
6. How do the boundaries change? Why?
7. Use the best value of **C** and evaluate the model on the **test set**. How well does it go?

What to do ⅔ - RBF Kernel

8. Repeat point 4. (train, plot, etc..), but this time use an RBF kernel
9. Evaluate the best **C** on the **test set**.
10. Are there any differences compared to the linear kernel? How are the boundaries different?
11. Perform a grid search of the best parameters for an RBF kernel: we will now tune both ***gamma*** and **C** at the same time. Select an appropriate range for both parameters. Train the model and score it on the validation set.
12. Show the table showing how these parameters score on the validation set.
13. Evaluate the best parameters on the test set. Plot the decision boundaries.

What to do 3/3 - K-Fold

14. Merge the training and validation split. You should now have 70% training and 30% test data.
15. Repeat the grid search for ***gamma*** and ***C*** but this time perform 5-fold validation.
16. Evaluate the parameters on the test set. Is the final score different? Why?