Week 8 - Support Vector Machines

Exercises

Question 1.

What is the fundemental idea behind "Maximal Margin Classifiers" (as well as their extensions "Support Vector Classifier" and "Support Vector Machines")?

▶ Click here for answer

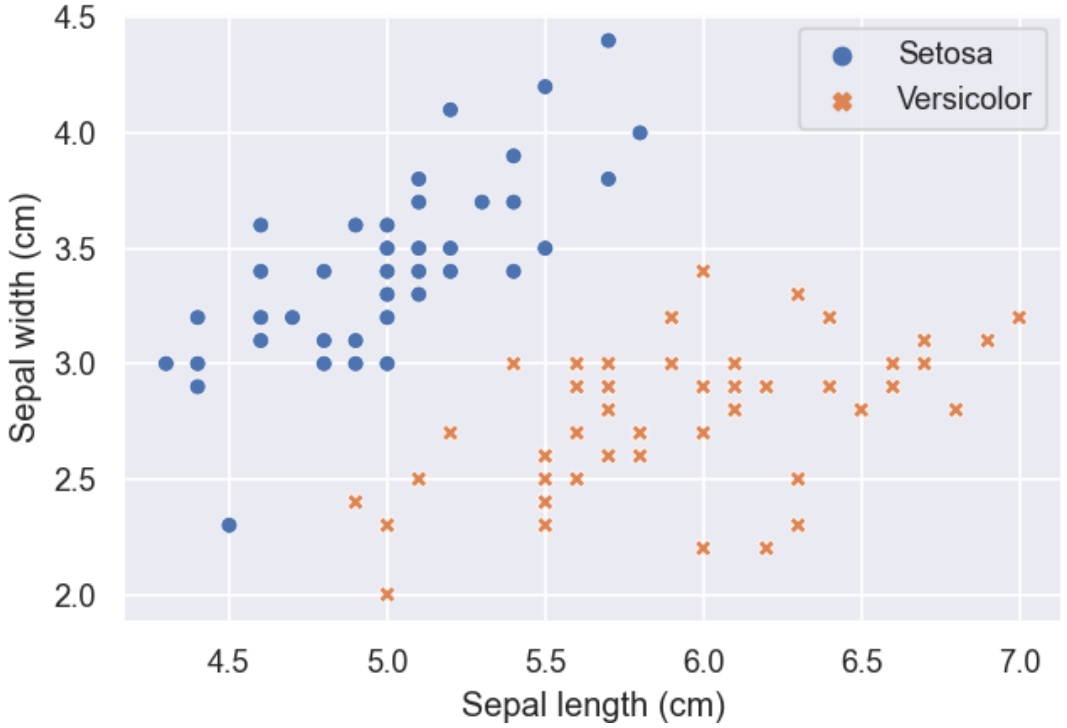
Question 2.

What is a support vector?

▶ Click here for answer

Question 3.

In the plot below, which points are the "support vectors"?



▶ Click here for answer

Question 4.

Sketch or code (using Python) the following two dimensional hyperplanes, indicating where $1 + 3X_1 - X_2 > 0$ and where $1 + 3X_1 - X_2 < 0$.

a. $1 + 3X_1 - X_2 = 0$

▶ Click here for answer

b. $-2 + X_1 + 2X_2 = 0$

▶ Click here for answer

Question 5.

Fundamentally, how are "Support Vector Classifier" and "Support Vector Machines" extensions of "Maximal Margin Classifiers"?

▶ Click here for answer

Question 6.

If C is large for a support vector classifier in Scikit-Learn, will there be more or less support vectors than if C is small? Explain your answer.

▶ Click here for answer

Question 7.

Is the "confidence score" output from a SVM classifier the same as a "probability score"?

▶ Click here for answer

Question 8.

Say you trained an SVM classifier with an RBF kernel. It seems to underfit the training set: should you increase or decrease γ (`gamma`) and/or C?

▶ Click here for answer

```
[NbConvertApp] Converting notebook SVM_Exercises.ipynb to html
[NbConvertApp] Writing 277380 bytes to SVM_Exercises.html
```