Universidade da Beira Interior
Departamento de Informática
Inteligência Artificial

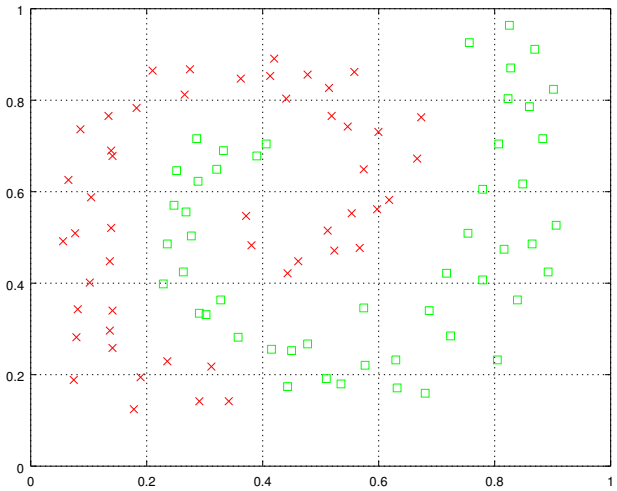
Practical exercises 7

Ano letivo 2019-20

Exercises

1. We have received the data file `size_price.csv` that contains house prices as a function of their sizes. We want to know what is the expect prize of a house with $350m^2$. Solve this problem implementing the linear regression predictor. The line equations are on the theoretical class slides.

2. In this exercise we will use an SVM from the scikit-learn library. There are several implementations, we want to use the SVC. Check here for examples. Create the SVC with the following parameter `svm.SVC(C=1000)` instead of using the default parameter as appears in the examples. Use the SVC to classify the problem of the two spirals:



Train your classifier on the data from file `espiral_train.csv` and estimate the generalization error on the data from the `espiral_test.csv`.

3. Adapt the code in the theoretical class slides to implement a naive Bayes classifier to solve the spirals problem.

4. Implement the k-NN classifier (**do not** use the implementation from the scikit-learn library). Use it to solve the spirals problem with $k = 1$ and $k = 7$.

5. Complete the following table with the test error rates you obtained in exercises 2 to 4. You should also compute the training set error rates for those exercises to complete the table. What do you conclude from this table?

Classifier	Train	Test
Naive Bayes	0.3	0.5
SVM	0.15	0.25
1-NN	0	0.0625
7-NN	0.01	0