Universidade da Beira Interior
Departamento de Informática
Inteligência Artificial

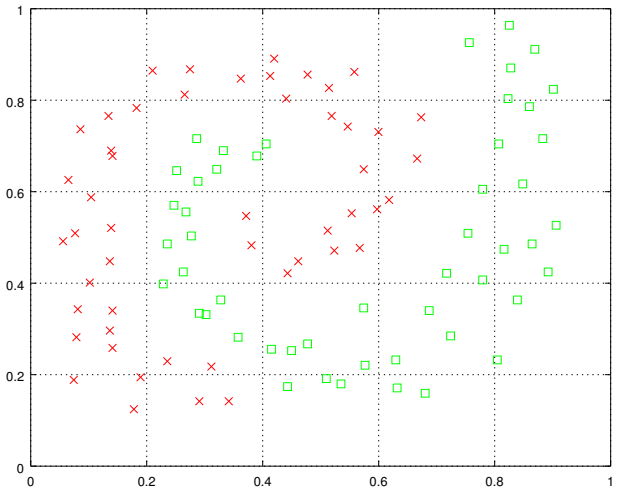
Practical exercises 7

Ano letivo 2018-19

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	30.00%	50.00%
SVM	15.00%	25.00%
1-NN	0.00%	6.25%
7-NN	1.00%	0.00%