6ELEN018W - Tutorial 8 Exercises

Exercise 1

Implement the diabetes prediction example using `sklearn` from the lecture slides.

Make sure that you type the code (not copy and paste) and understand every single line of code. Ask your tutor if any questions or in doubt about any parts of the code.

You can also study the documentation for this dataset in `sklearn` in:

`https://scikit-learn.org/stable/modules/generated/sklearn.datasets.load_diabetes.html#sklearn.datasets.load_diabetes`

Exercise 2

Using `sklearn` implement a neural network which is able to predict house prices. Use similar steps with the code for the diabetes problem.

The dataset is also well known (similarly with the diabetes dataset) and it is described in:

`https://www.kaggle.com/datasets/camnugent/california-housing-prices`

- The dataset is also built-in `sklearn` and it can be loaded using:

```
housing = fetch_california_housing()
X = housing.data
y = housing.target
```

Exercise 3

Implement using `sklearn` a neural network to solve the XOR problem.

If you do not remember what is the XOR problem (also described in the lecture), you can find the truth table of this boolean function at:

`https://en.wikipedia.org/wiki/Exclusive_or`

Make sure that you scale the data in an appropriate range (see the lecture slides).

Use the logistic function option for training the neural network:

`https://scikit-learn.org/stable/modules/generated/sklearn.neural_network.MLPRegressor.html#examples-using-sklearn-neural-network-mlpregressor`