

COMPUTING SUBJECT: Machine Learning

TYPE: WORK ASSIGNMENT

IDENTIFICATION: Perceptron Iris

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DEGREE OF DIFFICULTY: Medium

TIME CONSUMPTION: 30 minutes

EXTENT: < 10 lines

OBJECTIVE: Basic understanding of TLU.
Iris data set

COMMANDS:

IDENTIFICATION: ANNPerceptronIris/MICL

The Mission

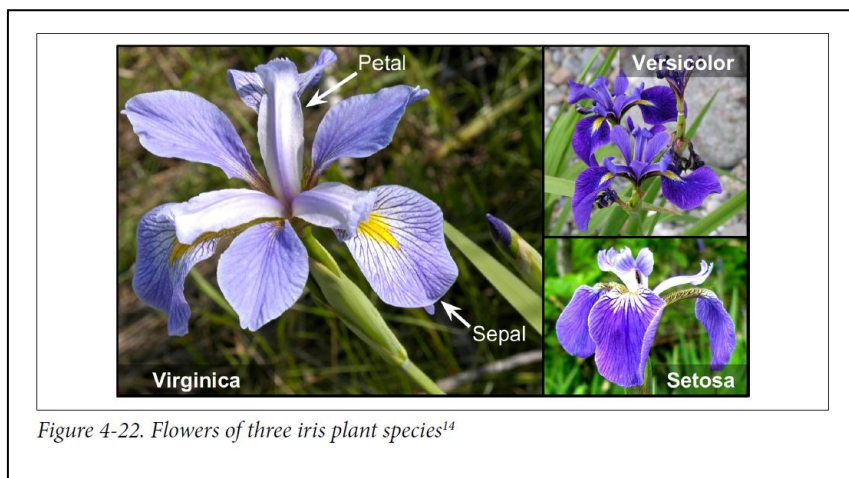
To understand the idea behind the simple Artificial Neuron Networks named the Perceptron.

Precondition

You must have read the second part of Training Models in chapter 4.

The problem

Given a data set of 150 Iris flowers (X) and the label, the correct value (Y), you are to train a Perceptron binary classification i.e. with 2 classes. You are to use the Iris data set built into Sklearn.



Useful links

<https://matplotlib.org/3.1.0/tutorials/introductory/pyplot.html>

Assignment 1: Download data set and program

As the data set is built in, we don't need to download it.

For the program it is **easiest** to download a downsized version with only the necessary code for ANN's from your teacher's home page. The file is "*Perceptron Iris Ch.10.ipynb*" encapsulated in the "*ANN Programs.zip*" file.

Alternatively, You could choose to from the Github to copy the Chapter 10 Jupyter program, "*10-neural-nets-with-Keras.ipynb*", into the folder for your solutions (Machine Learning/Solutions) folder. Rename it "*My ANNIris.ipynb*", before you cut away a lot of not-necessary code.

Assignment 2: Application program, adjusting the program

Start Jupyter and open the file. If you are using the downloaded *Perceptron Iris Ch10.ipynb* You don't need to adjust the program, otherwise you will now have to delete and out-comment many lines/cells like "Fashion MINST" and some examples.

Now we can start to execute the cells.

Assignment 3: Perceptron classifier

Run the cells one by one and on the way discuss some of the topics and write down the answers to the following questions:

- a. What is the idea behind Perceptron ?
- b. Can Perceptron also be used for regression ?
- c. Try to change some of the input parameters for predict- function.
Do it in the following way:
Add more cells, which use
 The petal data: [5, 2] as input parameters for predict- function
 The petal data: [5, 1.5] as input parameters for predict- function
- d. Just after the per_clf.predict function (Cell[7])
Add a new cell printing per_clf.intercept_, per_clf.coef_
What one earth are these values ?

Assignment 4: Using septal data

Lets see how it looks using only septal data.

DON'T delete anything use comment instead

Change it to use septal-data.

Tip: X = iris["data"][:,(0, 1)]

Tip: Use [5,2] and [7,2] for the predict/function.

Remember to write down the predict values. Also notice the change of a- and b- values.

Tip: To make a nice plot change the values of axes into [0, 10, 0, 7]

Congratulation: You are now an expert-level 2 in Perceptron classification ☺