Exercise 2 - Getting More Familiar with Python and Some Evaluation Criteria

IKT112 Concepts of Machine Learning

Purpose

The purpose of this exercise is for you to become more familiar with the Python programming language, and also understand the concept of different evaluation criteria better.

Before Starting

In this course, we will use Python as the programming language. There are different Python editors (software to execute Python code). Here are three alternatives that you can use:

- UiA's Jupyterhub (Recommended):
  `https://fe.uia.no/`

- PyCharm (you need to apply for a licence first, use your @uia.no email address):
  `https://www.jetbrains.com/pycharm/`

- Spyder:
  `https://docs.spyder-ide.org/current/installation.html`

- Google Colab:
  `https://colab.google/`

If you prefer another IDE or tool for programming Python you can use that one.

Get More Familiar With the Python Language

The first four tasks are from The Python Workbook, which can be found on the following link: `https://bibsys-almaprimo.hosted.exlibrisgroup.com/permalink/f/1imu1ht/TN_cdi_casalini_monographs_5368656`. Solutions to these tasks are provided in the latter section of the book. Remember to use VPN if you are outside the university's network.

Tasks:

1. Solve **Exercise 57: Is it a Leap Year?** in The Python Workbook.

2. Solve **Exercise 75: Greatest Common Divisor** in The Python Workbook.

3. Solve **Exercise 96: Check a Password** in The Python Workbook.

4. Solve **Exercise 137: Scrabble™ Score** in The Python Workbook.

5. Understanding different evaluation criteria:

```
true_labels = ['dog', 'cat', 'dog', 'cat', 'cat', 'dog', 'dog', 'cat', 'dog', 'cat',
                'dog', 'dog', 'cat', 'dog', 'cat', 'cat', 'dog', 'dog', 'cat', 'dog']
predicted_labels = ['dog', 'dog', 'dog', 'cat', 'cat', 'cat', 'dog', 'dog', 'cat', 'cat',
                    'dog', 'dog', 'cat', 'cat', 'cat', 'dog', 'dog', 'cat', 'cat', 'dog']
```

Using the lists above, or randomly making your own lists of cat and dog (or another animal of your choice), do the following calculations (not using any built-in libraries):

Calculating Accuracy:

- Task: Calculate the accuracy of the model using the lists above.

Calculating Recall for 'dog':

- Task: Calculate the recall for 'dog' of the model using the lists above.

Calculating Precision for 'cat':

- Task: Calculate the precision for 'cat' of the model using the lists above.

Calculating F1 Score:

- Task: Calculate the F1 score for the model using the lists, considering the F1 score for 'cat' and the F1 score for 'dog'.

Calculate the evaluation criteria manually to double check the results.