정보통신대학원 GITA315: Python Machine Learning

Spring 2022

Homework No. 2

Due 11:59 pm, Wednesday April 20, 2022

(Notice that the due date is not April 21.)

Submit the paper **by email** before the deadline. Notice that the delayed submission will entail a cut in evaluation by 30% for each delayed day.

Instruction for the submission of the paper:

- Your work should be *your own*.
- Your work can be either in English or Korean.
- Your work can be handwritten or typed.
- *Only* pdf file will be accepted.
- *File name* for the paper submitted *must* start with your **student number** followed by **student name**, for example, **A58005 홍길동** or **A58005honggildong**.
- Make sure that your paper includes homework number, name, student number, and the submission date.
- Your work should ***not*** include any type of '**cut and paste**'
- You should submit the paper via **email** at **pbg6567@sogang.ac.kr** and be sure to include "**gita315**" in the subject field of the email (for example, subject: gita315 homework 1).
- If you have any problem with submitting the paper, you may contact the teaching assistant 박병건 at the above email address.

Warning: When it is found that your work is not your own work, your paper won't get any credit and it may be considered in determining your final grade.

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Please **notice**:
In the *midterm exam*, answer sheets must be submitted in *pdf* form and *strictly in time*. Therefore you should be comfortable with generation and submission of the *pdf* file in a short time and the following may be useful for it.

- How to prepare the pdf file of your answer to be emailed.
  - ✓ You may use your own scanner to get the pdf file. Or
  - ✓ Using smartphone applications like FastScanner, you scan your paper and generate and send a pdf file. Those applications are available at PlayStore or AppStore.

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Problems:

1. Describe the differences between the gradient descent (GD) and stochastic gradient descent (SGD) methods used in AdlineGD and AdalineSGD implemented in Python. Your answer should be easy to understand and clearly described.
2. Which approach would you recommend to use in the Adaline among the GD and SGD? In your answer, you should justify your answer.
3. Considering the AdalineSGD implemented in Python discussed in the class,
   a) why do you think it is necessary to use the function 'shuffle'?
   b) decribe how it is implemented and works. Your answer should be clear and specific.