# Assignment 4

(1) Create a neural network with at least two hidden layers for a classification task. The dataset could be chosen arbitrarily, e.g. MNIST.
(2) Experiment with three activation functions (one linear and one non-linear) and report (i) accuracy and (ii) execution time.
(3) Experiment with three optimizers and report (i) accuracy and (ii) execution time.
(4) Experiment with "Dropout layer", "BatchNorm" and "Weight initialization" and report changes in accuracy and execution time.
I do expect you to prepare your report as follows:

| **Activation Function** | **Accuracy** | **Exec Time** |
|---|---|---|
| X1 | | |
| X2 | | |
| X3 | | |

| **Optimizers** | **Accuracy** | **Exec Time** |
|---|---|---|
| Baseline | | |
| X1 | | |
| X2 | | |
| X3 | | |

| **Regularization** | **Accuracy** | **Exec Time** |
|---|---|---|
| Baseline | | |
| Batch Norm | | |
| Dropout | | |
| Weight Init | | |

Write a half-page report about your observation and findings, what factors impacts the accuracy, and what factors have an impact on the execution time.

- You can choose the platform, but I recommend using PyTorch and Keras because they are the most popular platform nowadays.

- If you have any trouble during your work, please contact the TA before the deadline. The TA will help you progress in your homework, but she will not provide you with the answer.

- Late homework delivery results in a penalty on your grade, every late day 10%.

- Sharing this assignment with a party outside this course is a Boston University code of conduct violation, and violators will be reported to the dean for further prosecution.