



## 2nd group exercise

Delivery: 22.05.2022

### 1. Theoretical part (30 credits)

a) Study the following articles and their implementations.

Article	Implementation
<a href="#">Handwritten Digit Recognition with a Back-Propagation Network</a>	<a href="#">6.6. Convolutional Neural Networks (LeNet) — Dive into Deep Learning 0.17.5 documentation</a>
<a href="#">ImageNet Classification with Deep Convolutional Neural Networks</a>	<a href="#">7.1. Deep Convolutional Neural Networks (AlexNet)</a>
<a href="#">Very Deep Convolutional Networks for Large-Scale Image Recognition</a>	<a href="#">7.2. Networks Using Blocks (VGG) — Dive into Deep Learning 0.17.5 documentation</a>

b) Answer the following questions (in a text cell in the Notebook that will deliver)

1. Present a comparison table of the levels, filter size, activation function, number of parameters, and pooling and dropout techniques using the 3 different networks presented in the aforementioned articles.
2. What are the key differences in architecture and performance between the three networks?

### 2. Algorithm Implementation (70 credits)

It is given to you [an original notebook](#) to enter and review all the data you will use in the exercise. You will work with a subset of the data set [CIFAR-100](#). In the original notebook there is the `team_seed` parameter where you will define as a value the number of your team (eg If M25 then `team_seed=25`) in order to get the subset that corresponds uniquely to your team.

Save this notebook to your drive and follow the steps presented in it. You are invited to implement code and answer the related questions

The **deliverable** will be one **.ipynb file** where it will include the following:

1. the answers of the theoretical part (in markdown - text cell).
2. the implementations of the functions of the laboratory part (in a code cell) and in a markdown-text cell the comments of your results.

**Caution:** You should have saved the file `ipynb` having its entire execution printed (ie run it and save it and "download" it from the cloud so that its execution is visible). Those who wish, instead of uploading their notebook to eclass, can share their work notebook and upload the link to eclass (changes made after the date of submission of their work to eclass will not be taken into account).