Labs
Machine Learning Course
Fall 2023

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www.epfl.ch/labs/mlo/machine-learning-cs-433

Problem Set 13, Dec 11, 2023 (GPT and GANs)

Goals. The goal of this exercise is to

- Familiarize yourself with the GANs and GPT models.
- Have time to discuss Project 2 with the assistants and teammates.

1 Train GPT to perform multiplications

The goal of this exercise is for you to get more familiar with transformers and and GPT. We will focus on a much simpler task than language modelling that can be trained in a few minutes. Specifically we will train a small GPT model from scratch to perform multiplications. We will use indidual characters as tokens. Doing multiplications directly for example in the form: "12*34=408" can be challenging. Even large language models are often not able to do this accurately for moderately large numbers, say 5 digits (although it is possible using special tricks). Use the following Jupyter notebook gpt-multiplication.ipynb

Open in Colab: colab.research.google.com/github/epfml/ML_course/blob/master/labs/ex13/template/gpt-multiplication.ipynb
This gives you access to a free GPU.

2 Generative Adversarial Networks

The goal of this exercise is for you to get more familiar with GANs and generative models. Recommended reading: explore how to implement a simple GAN in PyTorch using the Jupyter notebook gans.ipynb:

- Open in Colab: colab.research.google.com/github/epfml/ML_course/blob/master/labs/ex13/template/gans.ipynb. This gives you access to a free GPU.
- Change the 'runtime type' to GPU under 'Runtime → Change runtime type'.