

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 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 individual 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` locally or open it as a Colab notebook. 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. Explore how to implement a simple GAN in PyTorch using the Jupyter notebook `gans.ipynb` or again open it as a Colab notebook. This gives you access to a free GPU. Change the 'runtime type' to GPU under 'Runtime → Change runtime type'.