

Homework 5

INSTRUCTIONS

- The homework is due at 9:00am on May 2, 2025. Anything that is received after that time will be considered to be late and we do not receive late homeworks. We do however ignore your lowest homework grade.
- Homeworks need to be submitted electronically on ETL. Only PDF generated from LaTeX is accepted.
- Make sure you prepare the answers to each question separately. This helps us dispatch the problems to different graders.
- Collaboration on solving the homework is allowed. Discussions are encouraged but you should think about the problems on your own.
- If you do collaborate with someone or use a book or website, you are expected to write up your solution independently. That is, close the book and all of your notes before starting to write up your solution.

1 Setup [0 points]

1. In this homework, we will build and experiment with VAEs through the Tensorflow2 framework. You should use [Google Colab](#), which provides free GPUs.
2. Upload hw5 files to your Google Drive.
3. Ensure you are periodically saving your notebook (File → Save) so that you don't lose your progress if you step away from the assignment and the Colab VM disconnects.
4. Once you have completed all Colab notebooks except `collect_submission.ipynb`, open `collect_submission.ipynb` in Colab and execute the notebook cells. This notebook/script will convert your notebooks into a single PDF.
5. Submit the resulting PDF to ETL.
6. Double check that two notebooks are correctly merged into a single pdf file!

2 VAE [50 points]

Follow and complete `VAE.ipynb`. Note that you can adjust learning rate or coefficient to the $\log C(\lambda(z)_i)$ term to achieve high Inception score.

3 GAN [50 points]

Follow and complete `GAN.ipynb`. Note that there are three 'inline questions' at the last of the jupyter notebook. Don't forget it!