PMLDL Assignment 1, Final solution

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1 Introduction

Leveraging pre-trained models like *t5-small* is an effective strategy for many translation tasks due to its compact size and resource-efficient nature. While *t5-small* offers reasonable performance and quick inference times, it may not be as suitable for complex translations or handling a broad array of languages as its larger counterparts. The choice between *t5-small* and larger models should be made based on the specific project's resource constraints, translation complexity, and desired quality level, with *t5-small* excelling in lightweight and resource-constrained scenarios. Due to my constraints in GPU power, this model is the best choice.

2 Model Specification

As previously mentioned, I fine-tuned the *t5-small* model, a compact but efficient pre-trained model. I made my solution by following the methodology outlined in *lab 5* of the PMLDL (Practical Machine Learning and Deep Learning) course. The model and tokenizer were taken from transformers.

3 Training

I fine-tuned *t5-small* for 20 epochs. The results are shown in the table below. Where *Bleu* stands for Sacrebleu score, and loss is *NLLLoss*.

Epoch	Training Loss	Validation Loss	Bleu	Gen Len
1	2.125500	1.714027	23.607900	13.265800
2	1.836600	1.656125	24.516800	13.215600
3	1.773000	1.627491	24.742000	13.204400
4	1.752800	1.610212	24.966800	13.119400
5	1.720500	1.595325	25.221800	13.114200
6	1.706400	1.585188	25.343100	13.093600
7	1.694800	1.577094	25.447300	13.088600
8	1.681600	1.570604	25.522300	13.100000
9	1.672200	1.565133	25.663900	13.067400
10	1.663400	1.562667	25.707100	13.035400
11	1.659800	1.558728	25.662800	13.063800
12	1.657500	1.556531	25.668000	13.062000
13	1.648600	1.554811	25.679000	13.048800
14	1.650800	1.554036	25.685600	13.050600
15	1.644200	1.553554	25.676400	13.048400

As we can see the Sacrebleu score is higher than the transformer has.

4 Evaluation

Example of prompts:
Bob is a bad guy! >>Bob is bad!
You are a dirty bastard! >>You're a dirty guy!
You should die! >>You should die!
We see that the pre-trained model can handle names compared to previous models, but still has no solid understanding of toxic words.

5 Results

As shown above, fine-tuning the pre-trained model became the best option for solving the task.