

Methodology:

1. Dependencies: Used several libraries, including Hugging Face Transformers, pepft (parameter-efficient fine-tuning library), accelerate, and TRL Library for fine-tuning generative models.
2. Dataset Preparation: Loaded a dataset containing dialogues between people. The goal is to fine-tune a model to generate summaries of these conversations.

<https://huggingface.co/datasets/knkarthick/dialogsum/viewer/default/train?row=0>

3. Data Formatting: The dataset is formatted into an instruction dataset with dialogues as input and summaries as responses.
4. Low-Rank Adaptation (LaRA): Introduced the concept of Low-Rank Adaptation, which involves fine-tuning specific parameters of the model, focusing on query, key, value, and other projections.
5. Training: The model is trained using the LaRA approach, with a special focus on adapting only specific parameters rather than the entire model.
6. Training Monitoring: Training progress is monitored using TensorBoard for visualization of training and validation loss.
7. Saving the Model: After training, the model is saved, retaining only the additional weights introduced through Low-Rank Adaptation.
8. Inference: loaded the trained model and perform inference by generating summaries from given dialogues.
9. Adapters for Different Tasks: Instead of saving the entire fine-tuned model, adapters can be saved separately and applied to the base model as needed for different tasks, enhancing efficiency.
10. Deployment: The trained and adapted model can be saved and deployed for various tasks, such as summarization or translation, by selectively combining adapters with the base model.

Results:

Summarize the following conversation.

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### Input:
#Person1#: Did you enjoy your weekend at the highland hotel? I heard it's and excellent place to stay and has good facilities.
#Person2#: I had a wonderful time. The rooms are not very big, but they are well furnished. The restaurant is excellent and reasonably priced. There's a sauna and a Jacuzzi.
#Person1#: Do they have a swimming pool?
#Person2#: No, they don't. they have a beauty parlor, but I didn't go there.
#Person1#: What's the service like?
#Person2#: It's very good. Check in and check out at the reception only took a few minutes. The wait staff is very good. A waiter recommended their baked fish, which tasted wonderful. The hotel was quite full, so I'd suggest making a reservation if you intend to go there. The hotel offers a discount at the weekends.
#Person1#: It sounds perfect. Did you have any complaints at all?
#Person2#: There was a problem with the internet access, so I couldn't check my email, but I didn't complain about it to the management.
#Person1#: I suppose you were happy to forget about the outside world.
#Person2#: Yes, I was. Here's their business card.
#Person1#: Thanks. Was there a mini bar in the room?
#Person2#: No, there wasn't. There is a bar on the ground floor and of course you can buy drinks in the restaurant to go with your meal.
#Person1#: One of the things I dislike about hotels is that everyone expects tips.
#Person2#: I know. At the inland hotel, they have an interesting policy. When you check out, you put some money in a special box at reception. Each evening, the money in the box is shared equally by the hotel staff.

### Summary:
#Person1#: Did you enjoy your weekend at the highland hotel? I heard it's and excellent place to stay and has good facilities.
#Person2#: I had a wonderful time. The rooms are not very big, but they are well furnished. The restaurant is excellent and reasonably priced. There's a sauna and a Jacuzzi.
#Person1#: Do they have a swimming pool?
#Person2#:
```

```
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```

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### Summary:
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BASELINE HUMAN SUMMARY:
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#Person2# enjoys #Person2#'s weekend at the highland hotel because of the hotel's excellent and reasonably priced restaurant and good service. #Person2# introduces the hotel's facilities, weekend discount, and its interesting tip policy and suggests #Person1# make a reservation in advance.
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TRAINED MODEL GENERATED TEXT :
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#Person1# and #Person2# talk about the highland hotel. #Person2# recommends the hotel. #Person2# says the hotel has a sauna and a Jacuzzi. #Person2# says the hotel is well furnished. #Person2# says the hotel offers a discount at the weekends. #Person2# says the hotel has a business card. #Person2# says the hotel has a bar on the ground floor. #Person2
```

Conclusion:

A comprehensive overview of the fine-tuning process, emphasizing the importance of quantization and low-rank adaptation (Laura) to efficiently train generative models. Demonstrates the initial model's limitations and sets the stage for the subsequent steps in adapting the model for improved performance in summarizing dialogues.