This project challenges you to build a machine learning solution for automatically summarizing dialogues using transformer-based models. You'll work with the SAMSum dataset to develop a BERT-based encoder-decoder architecture as well as the ChatGPT auto-regressive models that can condense conversations into concise, informative summaries.

You will need to apply your knowledge of natural language processing, deep learning, and model optimization to create an end-to-end solution for text summarization. The project tests your abilities to:

* Process and prepare conversational text data for deep learning models.
* Implement and fine-tune transformer-based architectures.
* Train and optimize models efficiently.
* Evaluate model performance using appropriate metrics.
* Analyze model outputs and identify strengths and limitations.
* Document your approach and results clearly.

Step 1

* Incorporate the feedback you received during the project critique.
* Ensure your code is well-organized, properly commented, and follows best practices.
* Optimize your model's performance based on your evaluation results.
* Generate final example summaries to showcase your model's capabilities.

Step 2

* Complete all markdown cells in your notebook with clear explanations.
* Document your design choices and their rationale.
* Explain any challenges you encountered and how you addressed them.
* Include analysis of your model's performance with appropriate visualizations.

Step 3

* Run all cells in your notebook sequentially to ensure everything works correctly.
* Check for and fix any errors or warnings.
* Verify that your model can be loaded and used for inference.
* Ensure all visualizations render properly.
* Remove any unnecessary code or commented-out sections.
* Save your final model weights to a shareable format.

Step 4

* Summarize your approach and key findings.
* Include quantitative results (ROUGE scores, other metrics).
* Discuss limitations of your current implementation.
* Suggest potential improvements and extensions.
* Connect your technical results back to the original business problem.

Step 5

You will submit a **link to your GitHub repository** containing:

1. **Jupyter Notebook** with:  
   * Your complete implementation with all code cells executed.
   * Include comprehensive markdown documentation.
   * Make sure all outputs, visualizations, and sample results are visible.
2. **README.md** with your project report and any additional instructions for running the code including:  
   * Problem statement and business context
   * Technical approach and methodology
   * Results and evaluation
   * Discussion of limitations and future work
   * References (if applicable)
3. **Model Weights (optional)**
   * If your model file is not too large, include the saved model weights.
   * Otherwise, provide instructions for reproducing your model.