Name: Alara Kaymak, Ryan Li
Project Title and Overview:

NegotiationGPT is a generative AI system that analyzes negotiation transcripts to model how people use different strategies—such as agreement, disagreement, or coercion—across dialogue turns. Using transformer-based architectures, the model encodes negotiation language into embeddings and learns how combinations of tactics reflect underlying strategic behavior. The project will explore how these strategies can be simulated or predicted through fine-tuning a language model on annotated negotiation data, enabling the model to generate responses consistent with specific negotiation styles.

Connection to Course Material:
This project applies multiple GenAI concepts covered in class, including tokenization, embeddings, attention, context windows, and parameter-efficient fine-tuning (LoRA). It connects to transformer sequence modeling and reasoning, showing how self-supervised learning can represent structured social interaction. By fine-tuning a pre-trained model such as Ollama 3 or LLaMA 3 on human-labeled negotiation data, the project demonstrates transfer learning, attention mechanisms, and interpretability in a behavioral context.

Problem Statement and Goals:
Negotiation analysis traditionally relies on manual labeling, which limits scale and consistency. Our goal is to train an AI model that can automatically detect and simulate negotiation strategies while grounding its predictions in human-coded data.
The dataset contains human-annotated negotiation transcripts, where each dialogue segment is labeled with negotiation codes such as AGR (agreement), DIS (disagreement), COER (coercion), and others. These annotations serve as ground truth for evaluating model accuracy and reasoning.
Objectives:

- Represent negotiation behaviors using transformer embeddings.
- Fine-tune a small LLM via LoRA to predict or generate negotiation codes.
- Analyze how different strategies (e.g., compromise vs. dominance) appear across dialogues.

Timeline / Project Plan:
Week 1: Clean and preprocess negotiation transcripts (from combined.xlsx) and prepare code labels.
Week 2: Generate embeddings and cluster strategic behavior patterns.
Week 3: Apply LoRA fine-tuning to a lightweight LLM (Ollama 3 / LLaMA 3).
Week 4: Evaluate model output against human annotations and prepare a presentation.
Success Metrics / Assessment Methods:

- Quantitative: precision/recall between predicted and annotated negotiation codes.
- Qualitative: human or peer review of generated dialogue realism and strategic consistency.
- Comparative: improvement of fine-tuned model over baseline pre-trained model.
- Visualization: embedding clusters showing strategy relationships.

Value Proposition:
NegotiationGPT demonstrates how generative AI can interpret and reproduce complex human negotiation behavior. It provides a scalable, data-driven framework for understanding communication strategies and testing behavioral hypotheses. The project bridges GenAI, psychology, and linguistics, showing how fine-tuned transformer models can reason about structured interpersonal interaction.

Alara's Primary Responsibilities:

Data Validation and Quality Assurance: Alara will manually validate the classification labels generated by the model, reviewing transcripts to ensure predicted codes (AGR, DIS, COER, etc.) match actual negotiation strategies. She'll develop a validation rubric based on the original annotations, document discrepancies, and track reliability metrics to identify systematic biases that can inform fine-tuning.

Contextual Fine-Tuning and Prompt Engineering: Alara will design and optimize prompts to guide accurate strategy identification. This includes developing few-shot learning templates, experimenting with different prompt configurations, and optimizing context window size. She'll conduct A/B testing to determine which contextual cues work best for model reasoning.

Data Augmentation: If certain negotiation strategies are underrepresented, Alara will explore data augmentation by generating synthetic dialogues that maintain authentic negotiation characteristics and manually validating them before adding to the training set.

Results Dashboard: Alara will create a dashboard to visualize model outputs and metrics, including embedding clusters, confusion matrices, and performance comparisons between the fine-tuned and baseline models.

Ryan's Primary Responsibilities:

Data Validation and Structural Analysis: Ryan will work alongside Alara on validation, focusing on technical patterns. He'll analyze whether misclassifications correlate with specific linguistic structures or dialogue positions, providing a complementary technical perspective.

Structural Fine-Tuning and Architecture Selection: Ryan will determine the best transformer architecture for our task, evaluating options like Ollama 3 and LLaMA 3 based on size, speed, and dialogue capabilities. He'll implement LoRA and potentially DoRA, configuring parameters to balance performance with computational efficiency.

Model Infrastructure: Ryan will build the technical foundation of NegotiationGPT, including data preprocessing pipelines, tokenization workflows, and training loops. He'll set up the fine-tuning environment, manage checkpoints, implement evaluation protocols, and handle integration with Alara's dashboard.

Joint Responsibilities:

Domain Knowledge: We'll both study negotiation techniques and terminology, learning the dataset's coding scheme and how different strategies appear in dialogue. This shared understanding will ensure consistency in validation and model development decisions.

Model Selection: Together we'll evaluate language models for two-party negotiation settings, assessing their ability to handle speaker personalities, maintain dialogue coherence, and represent strategic behavior based on contextual understanding and generation quality.

Results Analysis: We'll collaborate on interpreting outputs, comparing predictions to human annotations, and drawing insights about negotiation dynamics. We'll assess whether the model captures nuanced strategy combinations and what this reveals about effective negotiation techniques.

*Generative AI: Generative AI is used to help the writing and proofreading process but the ideas are originated from us without Generative AI.