**[Slide 1: Introduction]** Good morning, everyone. Today, I'll share our sentiment **& semantic Similarity Study** of AI-generated answers versus human answers about cybersecurity questions. we wanted to know two main things: Does AI answer more positively or negatively than humans, and how similar is the language AI uses compared to human experts?

**[Slide 2: Workflow Overview]**To answer this, I broke the work into three main steps. First, for **Data Preparation**, I directly used the Task-2 categories data that had already been cleaned and processed. Second, for **Sentiment Analysis**, we used TextBlob to find out how positive or negative each answer was. Third, **Semantic Similarity**, I used TF-IDF to turn both answers into number patterns and compared how similar they were. One challenge I faced was that some questions had no human answer, so we removed any entries where the human answer was empty, otherwise the comparison wouldn't work.

**[Slide 3:]**Here is our main chart showing the sentiment Difference between AI and StackOverflow on the x-axis and semantic Similarity on the y-axis. The most interesting finding is that Q4, where AI is more positive but has low similarity, makes up 46.9% of all cases. This means AI tends to be more upbeat but uses very different words than human answers. Q3, where StackOverflow is more positive with low similarity, comes next at 28.9%. High-similarity areas Q1 and Q2 only make up 24.1%, and even there, similarity scores rarely go above 0.3. This tells us that although AI often sounds slightly more positive, it rarely uses the same words or structure as humans.

**[Slide 4: Topic-Level Insights]** Looking deeper, I made topic-by-topic charts and calculated each topic's Q1 ratio, which represents cases where AI is more positive and has high similarity. The key findings show that Full-Stack Security & End-to-End Integration leads with 33.3% Q1, meaning here AI and humans agree more in both positivity and word choice. while Common Web-Framework Security Problems falls far behind at only 4.2%.

**[Slide 5:]**Across all eight topics, AI’s sentiment variance (σ≈0.08–0.13) is consistently lower than humans’, showing tighter, more predictable tone. AI vs. SO polarity differences remain under 0.07 in every topic, indicating overall alignment in positive/negative tone.Largest AI–SO gap in Data-at-Rest (Δ=0.065) and Full-Stack (Δ=0.063); smallest in Web-Framework Pitfalls (Δ=0.003). Leverage AI’s stability for consistent user experience, while human answers add valuable emotional nuance

**[Slide 6:]**Finally, we looked at the Top 10 most similar and Top 10 least similar answer pairs. High-similarity examples with similarity scores around 0.36 to 0.45. Low-similarity examples with scores around 0.00 to 0.01 happen when human answers are short, like "need check." AI then gives full explanations, so there's almost no word overlap.

**[Slide 7:]**To sum up, our study shows that AI answers are more positive than human answers and maintain a much more stable emotional tone without big mood swings. While the language similarity is limited, AI's consistent positive and steady tone makes it a good way for learners to gain cybersecurity knowledge. Unlike human experts who vary greatly in their responses, AI provides reliable and encouraging answers for students. Thank you for your attention. I'm happy to take any questions!