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1. Define NLP in your own words.
    a. Natural language processing is the process of teaching computers how to understand spoken human language. It is also about programming computers on how to respond appropriately based on the information they receive.
2. Describe the relationship between AI and NLP.
    a. Natural language processing is a subcategory of automated intelligence which allows computers to process human language.
3. Compare/Contrast natural language understanding and natural language generation.
    a. Natural language understanding is about processing speech and text to bridge the gap between people and computers. The main use is for automated chats and/or voice personal assistant systems like Alexa/Siri. The main purpose is to be able to translate human language into a form that computers understand and then go from what computers understand to human language. Natural language generation is used by computers to create human language on their own. This can be considered the last step of natural language processing for relaying information back to a human from a computer.
4. List some examples of modern NLP applications.
    a. Siri, Alexa, Google Home, predictive text, email filters, translation between languages
5. Write 3 paragraphs describing each of the 3 approaches to NLP and list examples of each approach.
    a. The rules based approach follows specific guidelines to define human language into computer terminology. These types of guidelines typically follow a pattern which can be considered a double edged sword. This is because while following rules helps to fill in the gaps of comprehension, the information being processed is more often than not generalized. This type of generalization can lead to the content being watered down causing the computer to interpret the information incorrectly.
    b. A statistical and probabilistic approach is most helpful when it comes to predictive text or implied speech. Language models like these use context clues to aid them in properly defining the intention of what is being articulated to them. Neural networks and other machine learning techniques fall under this category as well. This is because this type of approach learns from past experiences/interaction/mistakes and builds its knowledge off of that.
    c. A deep learning approach is a step above the probabilistic approach because this solution uses multiple artificial neural networks instead of just one. Due to this intricate process the results are more similar to natural human language. However, this is still one of the three approaches to NLP and deep learning works best when paired with the rules based and probabilistic approach as well.
6. Write a paragraph describing your personal interest in NLP and how you would like to learn more about NLP for personal projects / professional application.

a. Personally I would like to learn more about NLP because I only have a very minimal high level understanding of it right now. I think it would be very rewarding to be part of a professional project relating to NLP in industry. However, my main interest correlates more closely with cybersecurity so if NLP and cybersecurity could overlap that might be the perfect role for me. Perhaps in the sense of some kind of authenticator by verifying someone's identity based on voice. I am not sure how secure that could be long term though considering voice modifiers exist and that would relate more to the tone and pitch of a person's voice rather than their speech. All and all, that is about the extent I have thought about natural language processing.