a. define NLP in your own words
   NLP is Natural Language Processing. It describes the ability of machines to understand the natural human language like English.
b. describe the relationship between AI and NLP
   NLP is important for AI because it helps in applying AI to the real world. For example, digital helpers like Amazon's Alexa use NLP in order to interpret human language and understand what is being said.
c. write a sentence or two comparing and contrasting natural language understanding and natural language generation
   NLU allows computers to comprehend the human language, and can make inferences based not only on what is being said but also how. NLG allows computers to talk in the same way as humans. These fields are both helpful in the realm of AI, the main difference being NLU's concern with learning how to more effectively take human language as input, and NLG's concern instead being with how to more effectively output the human language.
d. list some examples of modern NLP applications
   Anything that involves translation, voice based helpers, or analyzing human language. Google translate, Alexa, and Siri are good examples of NLP that is used today.
e. write 3 paragraphs describing each of the 3 main approaches to NLP, and list examples of each approach
   rule based: The rule based approach to NLP is a simple approach that is essentially a set of rules that is used by the machine in order to analyze patterns used. Generally this approach is only used for very specific tasks, and generally does not do as well with more complex tasks, as the human language can be very complex. Regex, spell checks, and CFG are some of the most popular examples of this approach.
   statistical and probabilistic: This approach consists of using mainly the traditional machine learning, meaning the model will look for patterns while you feed it a corpus, which is data that is annotated to guide the machine as it looks for patterns. The issue with this is that it is expensive; data is required, and processing power as well.
   deep learning: This differs from machine learning because it is improved in almost all ways. It attempts to work the same way as a brain, and does not need to be hand held the same way a machine learning model would. This means the machine does not need annotated data, and can instead be fed it raw. The biggest limitation of a deep learning model would be the immense amount of data and processing power needed.
f. write a paragraph describing your personal interest in NLP and whether/how you would like to learn more about NLP for personal projects and/or professional application
   As a user of many products that use NLP and as someone who grew up in the age where NLPs were being rapidly improved and used by the public, the topic of NLPs was always very interesting to me. I have actually been looking into using Python and something called Glove vectors to work on a personal project of mine. Glove vectors perform an analysis on many words and provide vectors and distance between words. NLP is definitely something that will continue to grow faster and faster in the future, so I feel that it is important to learn.