Overview of NLP

A. Define NLP in your own words

- Natural Language Processing allows computers to process human language. Some examples that NLP can be used for can be a computer listening and processing a voice command, identifying spam emails, and sentiment analysis.

B. Describe the relationship between AI and NLP

- AI is more of a general term that refers to a computer simulating human intelligence. NLP is a specific field inside of AI that relates to understanding and processing human language. Some examples of other fields in AI are machine learning and neural networks.

C. Write a sentence or two comparing and contrasting natural language understanding and natural language generation

- Natural language understanding relates to processing a text and understanding the meaning behind it. Natural language generation would be the response that was generated based on the model.

D. List some examples of modern NLP applications

- Email spam filters
- Smart assistants
- Predictive text
- Language translation

E. write 3 paragraphs describing each of the 3 main approaches to NLP, and list examples of each approach

- The rules-based approach is the oldest form of NLP. The main idea is to read in a text and then follow predetermined rules to categorize it. This approach has difficulty scaling up as the program would have to be updated as human language evolves. An example of rules-based approach would be converting a list of words from plural to singular.

- The statistical and probabilistic approaches utilize mathematical approaches for language processing. The model would count the words and the determine the frequencies of the words and create models based on the information. These models are like more traditional machine in learning approaches such as Naïve Bayes, Logistic Regression, SVM, etc. An example of statistical and probabilistic approaches would be predictive text.

- The deep learning approach is the modern approach and uses neural networks, convolutional neural networks, and LSTMs. This approach aims to make human sounding approaches much more human-like interactions between the user and the computer. An example of this method would be a smart assistant such as Alexa and Google Assistant.

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

- My interest in NLP stemmed from a Google press conference back in May of 2018. Google revealed a demo of a new feature for its Google Assistant where it called a hair salon and had a human-like conversation with the receptionist to schedule an appointment. Back then, I thought that was the coolest thing ever and is part of the reason I wanted to major in Computer Science. I would like to learn about NLP for a professional application so I could possibly get a job in machine learning.