Overview of NLP

a) When it comes to human and computer communication, NLP is a fundamental part of the communication happening. Humans(users) communicate using words, typically English. When we think about the language that computers use it is often the binary language. When reading into NLP I was able to come to the conclusion that NLP is what connects both the human spoken language and the computers language (binary). NLP helps computers understand the human language.
b) When looking into the relationship between NLP and AI, we can determine that it is a parent child relationship. AI is a big topic and under that there are a bunch of smaller topics, one of them being NLP. NLP can make machines talk to computers and vice versa, which is important for any AI to work.
c) While Natural Language Understanding and Natural Language Generation are the somewhat similar, there are differences. They are similar in the sense that they are both types of interactions that occur between a computer and a person. Natural Language Understanding is the communication that occurs between a human to the computer, where the computer is responsible for understanding what the user in the human language is trying to communicate through speech or writing.
d) Email Classification, Language Translation and Smart Assistants (Amazon Alexa, Google Home)
e) The three main approaches after reading into NLP are; The rule based approach, the Statistics Approach and finally the approach of using Neural Networks for NLP.

Starting with the rule-based approach, this approach basically is made to mimic human intelligence. The accuracy is not always correct and due to how simple and old it

is, it can provide inaccurate results. When doing some research into the rule based approach I was able to discover that the most common examples of this are regular expressions and context free grammars. For example, when we consider stemming, this would be an easy inaccurate result to focus on, because the word would be stored as its stem rather than the entire word. The focus for this approach is mainly pattern matching and parsing.

The next approach that would be considered a main approach would be the statistics approach. This approach is a used to do probabilistic modeling, likelihood maximization and linear classifiers. The start of this approach was basically so machines were able to learn the rules automatically. A common example that I found while researching is cache language models. This approach was very prominent during the 1990's as this approach was more effective and modern than the rule based approach.

Finally the last main approach would be using Neural Networks. This approach came into prominence somewhat recently. It is an approach that uses large amounts of data, as of now this is an approach that is most often used. This is due to that fact that it does have the most accurate results compared to the other approaches. A example I came across is word embeddings which is used to understand the properties of words.

f) In recent times I have been met with quite a few health issues. I have been dealing with a lot of paranoia with my health and quite often wonder if the smallest sneeze may be a major side effect. I often catch myself on WebMD in a panic late at night, sometimes I resort to talking to the AI on WebMD which gives me some very random and insane diagnosis. I believe that using technology that includes NLP we could possibly make an AI that would be very accurate or somewhat closer to what people are feeling. Because sometimes it could be plausible that a sneeze is nothing more than a sneeze.