Overview of NLP

A. Natural Language Processing refers to the study of computers being able to process and understand speech and text in the way that humans process them.
B. AI (Artifical Intelligence) relates to NLP (Natural Language Processing) in the sense that AI utilizes NLP to be able to further process and respond to human speech and text.
C. Natural Language Understanding (NLU) and Natural Language Generation (NLG) are both facets of NLP, as the ultimate goal of the study of NLP is to be able to utilize both Understanding and Generation. However, they differ in the sense that NLU focuses on computers being able to read and process speech/text, while NLG focuses on being able to respond to a given input and write an appropriate response.
D. Some modern NLP applications include:
    a. Email Filters (example: Filtering spam)
    b. Smart assistants (Alexa, Siri, Google Home, etc)
    c. Predictive Text (when using search engines)
E. Three Approaches to NLP:

    The first approach to NLP is the rules-based approach from the 1960's. This refers to the simple technique of writing a (finite) ruleset to categorize the different parts of speech. Examples include spell check, context-free grammar, and the Eliza chatbot (a program to simulate an AI therapist).

    The second approach is the statistical and probabilistic approach from 1980's. This refers to the use of data sets to train an AI to recognize patterns in human speech (machine learning). Some examples include use of word frequencies and traditional machine learning algorithm.

    The third approach is the deep learning approach from the 2010's. This refers to using big data (large volumes of data) to further train and improve an AI. Some examples include language translation, generation, and improved understanding.

F. I'm personally interested in the practical applications of NLP such as smart assistants and being able to communicate organically and naturally with a computer. I would like to learn about the current limitations to speech assistants that prevent users from being able to speak to their assistants in the same way that they would communicate with their fellow man.