Overview of NLP

a. define NLP in your own words
NLP is a field in computer science that focuses on teaching computers to understand written or spoken human language.

b. describe the relationship between AI and NLP
NLP falls into the category of AI as it helps computers behave like humans.

c. write a sentence or two comparing and contrasting natural language understanding and natural language generation
Natural language generation is when a program produces written text or audio from a given data without necessarily understanding it. For example, reading an article and then summarizing would be considered natural language generation. Natural language understanding, on the other hand, involves understanding the text/audio and then producing some sort of output. For example, a chatbot like Siri on iPhones uses natural language understanding technologies.

d. list some examples of modern NLP applications
Alexa Assistant, Siri, Google Assistant

e. write 3 paragraphs describing each of the 3 main approaches to NLP, and list examples of each approach
Rules-based approaches are approaches where some rules are set in a program in order to understand a language or do something with it. For example, a program could convert a word from present tense to past tense by adding “ed” in the end or checking for exceptions that have unique words in their past tense form. It’s very limiting, especially for a language that is always evolving and thus creating new rules as well as modifying the old ones.

Statistical and probabilistic approaches are approaches where the laws of probability are used in order to better understand a language. For example, with the laws of probability, it’s possible to predict if an email is spam by looking at the frequency of words used in a particular sequence. Machine learning algorithms are oftentimes present in those approaches as in order to understand that an email is a spam, you need to teach the computer by providing data.

Deep learning is an approach where a lot of data is used for building neural networks that help to understand a human language. An example would be trying to teach a computer to sound like a human. It requires a lot of audio data and time for the computer to get better at sounding like a human.

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

I would like to learn more about NLP for personal projects as well as just explore a new field of computer science. As of right now, I am planning to become a full-stack developer, and I think that knowing NLP would be beneficial as it would make my web projects more advanced. It also could help me later on in life as NLP is a field that has a lot of potential in general.