a. Machine learning is a methodology of getting a computer to gradually get better at a specific task without requiring the programmer to create an explicit algorithm for performing that task.

b. Data is important to ML because the effectiveness of AI training is largely affected by the breadth of data that the model can be trained on. Without a lot of training data, the model will perform poorly against novel inputs. Pattern recognition is important because the ability to recognize patterns in data is what enables ML algorithms to learn. Accuracy is important to ML because a model will be judged based on how accurate it is at performing the given task in comparison to some baseline accuracy.

c. ML is a branch of AI.

d. AlphaGo is an AI made with machine learning that plays Go at a top level. This type of application could not have been made with traditional algorithms due to the sheer complexity of Go, as it is too complicated for a tree-search AI to efficiently judge all the possible branches of a game.

   YouTube uses machine learning to develop its recommendation system. While it may be possible for humans to program an explicit algorithm that recommends videos based on a user's watch history, a constantly improving ML model can do a better job of maximizing user watch time on the platform.

e. An observation is a row of data. ML models are trained and tested on a set of observations. A feature is a column of data. Models are trained to take some features, called predictors, and predict the value of an associated target feature. Quantitative data is numeric data. Qualitative data is non-numeric or categorical data. Whether data is quantitative or qualitative is important in determining what ML algorithms should be used.

f. I am interested in ML because I have a general interest in AI and AI applications. I also have multiple ML-related ideas for personal projects that I would like to complete someday. Because of this, I am looking forward to continuing to learn about ML even beyond this course. Depending on how my interest in ML grows, I am considering making ML a focus of my career upon graduation.