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Overview of ML

a.

Machine Learning is using algorithms and AI to analyze data and improve its performance based on that information.

b.

Data, pattern recognition, and accuracy are foundational pillars of machine learning. In machine learning, without data there is nothing. We create the algorithms and models based on what the given input data is and the machine learns throughout its data analyzation process. Pattern recognition is important in machine learning because that is what makes it somewhat "human". Our cognitive ability to recognize patterns in data and overall life such as recognizing a stop sign after seeing only a few is what puts our minds in a field of their own. In machine learning we are trying to emulate that aspect in a more concentrated field to allow it to improve. The last important term is accuracy. Accuracy is what determines the effectiveness of our machine. If the accuracy of the machine is improving over time, that is what signifies to us that it is improving its performance. If the accuracy flatlines, we are able to conclude that the algorithm has hit a capacity and a change must be made.

c.

Machine Learning uses Artificial Intelligence. AI is a much larger field than just machines algorithmically improving their performance to complete a task. AI refers to making machines process using logic and reasoning like a human's mind would.

d.

The first example is obviously ads/product marketing. Almost all shopping sites use machine learning in order to show consumers what they would be interested in, and would therefore buy. In traditional programming, you would not be able to personalize this marketing and would simply promote your most popular products and hope that they would appeal to consumers, which would be much less effective.

The second example is how PayPal uses Machine Learning to combat money laundering. They are applying these machine learning algorithms which are analyzing transactions and learning how to find these illegal transactions. This could not be done using traditional programming because they would simply just have to set parameters when making transactions, and that would make the process more inconvenient for the average user and would be easily worked around.

e.

In machine learning there are many important terms that have to do with dealing with the data that is being analyzed. Observations are singular examples of data, usually in the form of a row. Features are one specific aspect of data, usually in the form of a column. There are also two different types of data in quantitative and qualitative data. Quantitative data uses real numbers where qualitative data uses categories or other means of description. All of these terms help us define the datasets that are being used in an analysis.

f.

I am interested in Machine Learning because I have watched so many videos of ML and AI being used to complete different tasks. These videos have taught me that Machine Learning is

essentially the future of technology and I want to be able to work with these algorithms and models in my future. I am always looking for opportunities to challenge myself which is why I initially was intrigued by CS and now I feel the same way when learning about ML. I would like to use Machine Learning in my job as well as in personal projects. Personally, I am beginning to try to make a video game and I would love to be able to apply Machine Learning to make NPC interactions extremely realistic.