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a. Machine Learning (ML) is the practice of creating / utilizing computer systems that do not follow explicit instructions; rather, the system utilizes various algorithms and / or statistical models to identify patterns in data.
b. ML utilizes all three of data, pattern recognition, and accuracy to successfully create a way to solve a problem that standard algorithms would not be able to as well. Data is important for ML because it creates a starting point and base that the algorithm can begin to draw patterns; without a dataset, there isn't anything to identify patterns and draw inferences from. Pattern recognition is also important in that it's what allows the algorithm to create predictions and analysis for a certain problem. Accuracy is also crucial to ML in that without accuracy, the quality of what the ML algorithm produces may be lacking, faulty, or otherwise unusable. Accuracy also allows the ML system to identify patterns more easily within the data set.
c. Certain types of AI utilize ML since standard procedures would not be able to create specific types of AI that want to act more humanlike or more fluidly.
d. -Image Recognition:
   Machine learning is used in image recognition to draw patterns from pictures to attempt to accurately identify types of images (example: discern a dog from a cat). This would not be able to be done with traditional programming since the algorithm must be trained to identify and categorize various images based on patterns, rather than on a static set of instructions.
   -Social Media Recommendations:
   Machine learning is used in social media recommendations to draw patterns from a user's activity on the platform, analyzing them and procuring other content that will incentivize a user to continue to use the platform. This would not be able to be done with traditional programming since there is no traditional algorithm that would be able to cater to every type of user; instead, machine learning is used to train an algorithm that identifies patterns in a user's activity and behavior.
e. An observation is some relationship between data identified within a dataset which is important to machine learning in that observations are used to build how the algorithm functions and what it might look for in a dataset. A feature is some aspect of the dataset such as the temperature of a city; they are important to machine learning since they are what makes up the foundation of a dataset and what to draw observations or analysis from. Quantitative data is data that has some concrete value to them, such as monetary value or, again, temperature of a city while Qualitative data is data that cannot be easily expressed by a numeric value, such as images or open-ended survey responses.
f. To be completely honest, my initial personal interest in ML was very small; I mostly took this class based off a combination of factors such as it fitting my schedule, me needing an elective course, my friends taking the course, and my dad being really interest in ML. However, even just after the first week of taking the course, I'm already interested in how I can personally implement ML into personal projects such as creating bots for my various interests.