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CS 4375.004

Overview of ML Assignment

a. define ML in your own words:

Machine learning is a broad term that generally is used to refer to strategies or techniques used in a machine to process a collection of data and ideally arrive at some sort of conclusion.

b. in a paragraph, summarize the importance of data, pattern recognition, and accuracy in machine learning

The more data that is available in machine learning, the more likely the machine will be able to recognize a pattern and make an accurate prediction. However, inaccurate data will make it harder for the machine to recognize such a pattern and will affect the accuracy of the machine's prediction.

c. describe the relationship between AI and ML

Artificial Intelligence and Machine Learning are closely related subjects that have some overlap. While artificial intelligence is concerned with simulating human behavior, machine learning is concerned with learning from data. Since learning is a part of human behavior, machine learning is often artificial intelligence as well.

d. list at least 2 examples of modern machine learning applications, and explain why these application could not be built with traditional programming

Speech recognition is very complicated to tackle with traditional programming because human voices can differ significantly between individuals, but speech recognition is ideal for machine learning since the user feeds the program new data every time they use it, improving the accuracy of the machine.

Image recognition is similar because the scale of a traditionally programmed application that can recognize images is too great. But with machine learning, a machine can take the individual pixels and derive information from them, eventually being able to recognize a picture of someone's face due to the patterns in the picture.

e. In a paragraph, define the terms observation, feature, quantitative data, and qualitative data and discuss their importance in machine learning

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In a data set, each row in a table is called an observation, while each column is called a feature. A feature is quantitative if it is numeric, while a feature is qualitative if it takes on a finite set of values. These terms are important in machine learning as we want to predict a target by taking in an observation and reading the values of each feature. On the other hand, categorical terms like quantitative and qualitative data were created to further our understanding of these values.

f. write a paragraph describing your personal interest in ML and whether/how you would like to learn more about ML for personal projects and/or professional application

I've heard a lot about machine learning and how it's applicable to various situations, but I don't quite understand how it all works from a software and hardware perspective. I've seen it most used in solving puzzles, so I figured it was like a very fluid program whose parameters would change in response to the success of the machine's most recent generation. I suppose my idea of machine learning may have been askew as machine learning as a term that has been thrown around a lot in already complicated contexts which gave me the impression that it was a more complicated concept than it really is. I'd be interested in learning about how machine learning is used for predictive analytics.