Haniyyah Hamid
CS 4375.003
Dr. Mazidi
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Overview of ML

a. Machine learning is teaching computers how to recognize patterns as accurately as possible with given data and understand through data analysis how to predict future data and create action selection by autonomous agents as well.

b. Data is incredibly important in ML as nothing can be derived from a machine if it has no raw input data to begin with. With data, comes the importance of pattern recognition which comes into play by analyzing said raw input data and creating patterns. The ability to recognize patterns is important to make predictions. With pattern recognition, it is also very important to maintain accuracy. A machine can be able to detect patterns, but it must do so accurately to not risk mistakes. In the case of facial recognition, if the machine detects the wrong suspect in a crime investigation, the consequences of this mistake will be severe.

c. Machine learning uses artificial intelligence, in the sense that ML is a subset of AI. Machine learning uses artificial intelligence alongside data science and statistics/probability.

d. Facial recognition could not be built with traditional programming as this sort of application requires the machine to be taught how to detect specific facial characteristics, edges, and regions to be able to identify them in the future. Similarly, social media advertising cannot be built with traditional programming as this sort of application requires the machine to be able to detect patterns within a large sum of data.

e. An observation is a specific point in a large set of data. A feature is the classification of specific observations. Quantitative data is numeric data and qualitative data is the analysis of a set of observations or observations categorized. These terms are all important in machine learning as these terms are necessary data required to create accurate predictions from patterns found amongst them.

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    f.   My personal interest in machine learning was the fact that it's a field of computer science that I

believe, along with many computer scientists, will have an immense impact on the future of

society. I would like to learn more about ML for personal projects as well as professional

applications potentially. I hope to be able to use R and python specifically to create various

machine learning applications such as facial and speech recognition machines. To be able to

understand and create those two specific applications is something I strive to be able to do one

day.