1. Machine learning is where machines are given data, they analyze the data for patterns, and then the use the patterns to predict future data.

2. Data is the core of all learning, not just machine learning. Data prediction is the goal, but relevant data is required for said prediction to occur.

   Data by itself is useless. Data is gathered and examined to find patterns. Patterns reveal correlations and trends which can used to predict future data. This future data can determine which actions should be taken.

   Even though many predictions can be made, only those with a high accuracy can be relied upon. No prediction is guaranteed, but those with a high accuracy can be trusted enough to make important decisions on.

3. As is explained in Kristin Burnham's article "Artificial Intelligence vs. Machine Learning: What's the Difference?" [1], A.I., as the name suggests, is when a computer artificially replicates human intelligence. Specifically, they learn and can use what they learn to solve problems.

   As such, Machine Learning is basically the process in which A.I. accomplishes these feats. Data is analyzed and algorithms are created to predict future data or come up with proper responses.

   A.I. is the goal, and machine learning is the tool to get there.

4. As is shared in Nikita Duggal's article "Top 10 Machine Learning Applications in 2021" [2], one example of machine learning is product recommendations. On an online shopping website like Amazon, data such as what someone has viewed/saved/purchased is all tracked. The data is analyzed and used to recommend products a person is most likely to buy.
   Given the sheer volume of shoppers and purchases on a site like Amazon, it is very unreasonable to demand people to examine that data and produce as many accurate and useful recommendations as a machine.

   Another example shared by Nikita[2] is language translation. Even though language translation is a skill best performed by people, it doesn't change the fact that it's difficult to expect a person to learn every language and be on demand all the time. As such, it's best to let a machine figure out the best translations between languages and provide near instant responses.

5.

- Observation – A sample data point in a table. It provides the value for each column of data for a specific instance.
- Feature – Contains each instances data related to the specific column.
- Quantitative data – Data with numeric values.
- Qualitative data – Data that can only be one of a finite set of values.

Observations provide machines the basis in which to start learning. Features help separate and determine relations between data. Quantitative data lets mahines know a large variety of data can be entered, and thus the data can be apply many algorithms to figure out trends. Qualitative data lets the machine know it's more of a label and can't exactly be used for algorithms.

6. I am interested in machine learning for both personal and professional reasons.

While many people are afraid of machine learning, I am personally impressed in its usefulness. I wish to make a game, but can't possibly become a professional in every aspect of game development such as writing, art, and music. If I could refine the work of an A.I., that would make this goal significantly more realistic.

I also noticed that many, many companies requested A.I. work for the senior projects. I had no experience and couldn't to apply to about half of them. If it's in such demand, it must be a useful still to have.

Works Cited

[1] Burnham, Kristin. "Artificial Intelligence vs. Machine Learning: What's the Difference?" *Northeastern University Graduate Programs*, 6 May 2020, www.northeastern.edu/graduate/blog/artificial-intelligence-vs-machine-learning-whats-the-difference/.

[2] Duggal, Nikita. "Top 10 Machine Learning Applications in 2021." *Simplilearn.com*, 11 Jan. 2023, www.simplilearn.com/tutorials/machine-learning-tutorial/machine-learning-applications. Accessed 28 Jan. 2023.