

define ML in your own words:

Machine learning is a subfield of computer science that uses algorithms to identify patterns and make predictions without explicit rules or instructions.

---

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

Data, pattern recognition, and accuracy are the tenets of machine learning that enable algorithms to be effective. Without the accuracy of the pattern recognition in the data or data sets, the algorithms designed will fail to be effective at its tasks. Without pattern recognition, there would not be any way to learn from the data in a way that could create an effective algorithm. Without data, there would not be anything to analyze to create an effective pattern recognition causing the algorithm to be more of a thought experiment rather than anything that would be useful.

---

describe the relationship between AI and ML:

Artificial intelligence is the broader computer science concept which uses machine learning algorithms to complete the desired/designed tasks of that artificial intelligence.

---

list at least two examples of modern machine learning applications, and explain why these applications could not be built with traditional programming:

Two modern examples of machine learning are openAI's two latest creations, DALL-E 2 and ChatGPT. Both of these applications use machine learning to take user input and create desired results that are synthesized rather than found. From what I know, both of these use complex matrix multiplication to create images and responses. This could not be built using traditional methods of programming because it would involve a complex series of if/switch statements that would be impossible to encapsulate all user queries.

---

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

An observation is a sample data point which usually encompasses a row of data on a datasheet, a feature is represented by the column which is a singular type of data (in my program radioactivity/spotifyeval.rmd "Tempo" would be an example of this), quantitative data is a numeric feature where all of the data in that column/feature is numerical, and qualitative data is a feature that is a "finite set of values" (in spotifyeval.rmd, an example of this could be "mode" where a minor key and a major key are represented with 0 and 1. I know this is represented quantitatively, but the data it represents is finite between minor and major keys). The importance

of this brings us back to why we need data for machine learning. It is important to have good data for the accuracy and pattern recognition of the algorithms, and all of these terms help define what makes a data set good. While having all of these does not make a data set inherently good, they are important terms to help programmers create algorithms.

---

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

My personal interest in machine learning comes from two places: the recent surge in openAI's popularity and because my friend who is a senior developer said this class would both interest me and be a great learning experience. While I don't know that I have any personal use cases for machine learning, I do agree that this class can help introduce me to jobs that would be outside of my current knowledge. I also agree with my friend's statement that I would enjoy this class because this is one of the most engaging classes I have taken so far. I believe the professional applications of this will help me in the job market and be of great use to me.