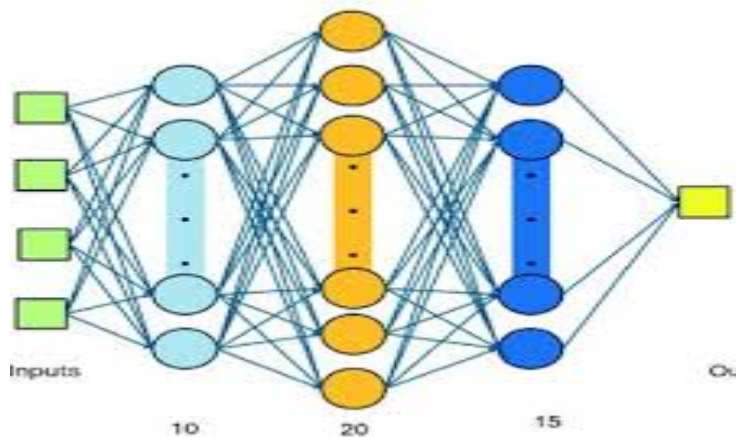


AI vs ML

- Artificial Intelligence is the concept of machines MIMICKING human thought
- Machine Learning is the semi-automatic process of machines getting better at predicting and mimicking how we think.
- Machine Learning uses Neural networks to predict

What are neural networks?

- Based on the neurons of the human brain
- Mathematically:
 - Function $f(x)$ predicts y given $X_1, X_2, X_3, X_4, \dots$
 - This happens over multiple hidden layers where bias is added
 - After the input is transformed, a linear transformation occurs to interpret into output
 - <https://www.ibm.com/think/topics/neural-networks>
- Basically, the model recognizes patterns and spits out what they think the next best word is.
- **IMPORTANT POINT TO MAKE: These things are not smarter than us, they simply predict the best word based on lots of data of precedent.**



Why does it take so much energy?

- Large language models use this formula hundreds of times over and have taken in extremely large amounts of data to make more accurate predictions.
- Data centers like ones found in DC use immense amounts of energy and water to cool them. These centers contribute to about 1% of the US carbon footprint. Possible to feel heat emanating off of them.
- <https://climate.mit.edu/ask-mit/ais-energy-use-big-problem-climate-change#:~:text=For%20one%20of%20the%20world's,energy%20needs%20are%20growing%20again.>

The beginnings of AI in the US

- <https://st.llnl.gov/news/look-back/birth-artificial-intelligence-ai-research>
- <https://www.ibm.com/think/topics/history-of-artificial-intelligence>
- Alan Turing conceptualized Artificial Intelligence in the 1950s in the paper "Computing Machinery and Intelligence" to answer the question "What if machines could think like humans?"

- As early as the 1960s, AI research was being funded by the Department of Defense
- Association for the Advancement of AI was established in 1979 which