CIS 678 Machine Learning

Basics of Probability

Standard vs AI solutions

- Find the maximum from a given list of numbers.
- Whats was the recorded lowest temperature of Grand Rapids in last 20 years?

Standard vs AI solutions

- Find the maximum from a given list of numbers.
- Whats was the recorded lowest temperature of Grand Rapids in last 20 years?

- Will it snow tomorrow? What are the chances?
- Who is going to win in the next NFL games between Texans vs Ravens?
- Translate the following into "French":
    - *"English and French are two European languages; they have a lot in common; however they also possess a lot of differences, especially when we talk about conjugations, contractions and gender usages."*

Standard vs AI solutions

- Difference between a regular/standard and an AI/ML algorithm
    - Regular/standard algorithms (Deterministic)
    - AI/ML algorithms (non deterministic, lives with uncertainty)
    - Probability theory is the branch of Math that talks about uncertainty.

Standard vs AI solutions

- Fill in the Gaps

    - I am very ……???…….

Standard vs AI solutions

- Fill in the Gaps

    - It's already 7pm; I have been working since early morning, I am very ....??? ......
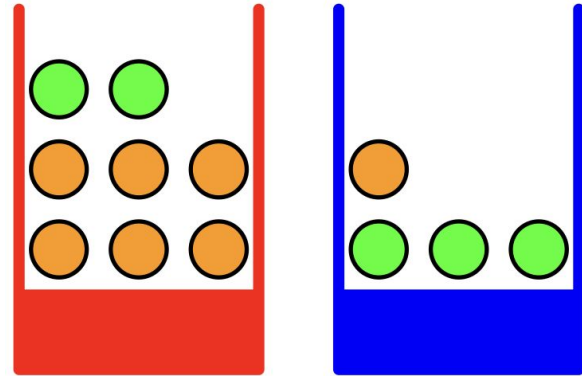
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- Additional context can help us reduce uncertainty
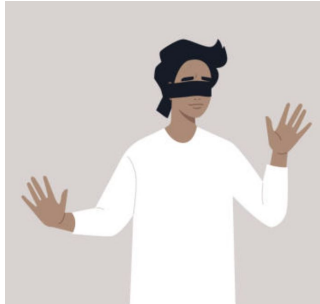
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- Additional context can help us reduce uncertainty

- "**Probability**" is the branch of **Mathematics** which helps us quantify, measure, and explain uncertainty

Basics of Probability

- There are some orange and green balls in a red and blue box
- Someone (blinded) picked up a ball and it found to be with color orange
- *What is is probability that the ball came from the red box?*

Let's try to solve this question...

Basics of Probability

We will share the solution in our next class…..

What we have learned

- Differences between Standard vs AI solutions
- Uncertainty is attached to AI solutions
- Probability theory is to a tool to explain and manipulate Uncertainty
- Some Basics of Probability theory
    - Summation Rule
    - Bayes Rule
- Our Probability journey starts here