Utility

Ordinal Utility Scales

- Outcome as objects
- Find a preference regarding to an object (a more generalized concept)
- Pairwise generally means "occurring in pairs" or "two at a time"
    - Mathematically, it refers to taking **all unordered 2-subsets** of a given set.
- indifference, choose one of those randomly

Properties of binary relations

- Irreflexive does not mean that it is not reflexive
    - Not reflexive means reflexivity does not hold but it does not imply that it is irreflexive.
- Reflexive does not mean that it is not irreflexive
    - Reflexivity and Irreflexivity have their own definition
    - Relation : like. It does not apply that every one like himself or no one like himself
- The above also apply to symmetry and asymmetry
    - Not symmetric does not imply it is asymmetry
- Some relation hold in some cases and does not hold in some other cases (like Symmetry and Asymmetry).

Required Properties

- Completeness, when compare two objects, the outcome must be one of following : $x \succ y$ or x ~ y or $y \succ x$

Interval Utility Scales

- Assume an agent is rational enough to follow the principle of maximizing expected utility.
    - Modelling this based on the preference given by the agent
- All numbers used in "Mr Simpson" example are chosen up to the point that this person agree that two options are equally attractive.
    - Number playing
- *Lotteries* includes those are with 100%