d) Are there more or less rational ways of assigning subjective probabilities?

→ Binary Relations

* See 1/10/17 lecture (Binary Relations Section)

→ Preference Relations

* A binary relation on X that's complete and transitive is called a preference relation on X.
* $x \succsim y$: "x is weakly preferred to y"
* We can describe an individual's preferences over a set of objects (or outcomes) X, using a preference relation, denoted $\succsim$.
* Transitivity: Take any 3 prizes from X for which $x \succsim y$ and $y \succsim z$. Then $x \succsim z$.
* Proposition: If the preference relation $\succsim$ on X is both complete and transitive, then there is a utility function $u: X \to \mathbb{R}$ such that, for all $x, y \in X$,

$$x \succsim y \iff u(x) \geq u(y)$$

* If $u: X \to \mathbb{R}$ is a utility representation, any monotonic transformation of u is also a utility representation of $\succsim$.

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★ Utility Functions

→ Utility functions and utility maximization are just tools for representing choices.