



Artificial Intelligence Programming

Introduction to Probability

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Uncertainty

- In many interesting agent environments, *uncertainty* plays a central role.
- Actions may have nondeterministic effects.
 - Shooting an arrow at a target, retrieving a web page, moving
- Agents may not know the true state of the world.
 - Incomplete sensors, dynamic environment
- Relations between facts may not be deterministic.
 - Sometimes it rains when it's cloudy.
 - Sometimes I play tennis when it's humid.
- Rational agents will need to deal with uncertainty.

Logic and Uncertainty

- We've already seen how to use logic to deal with uncertainty.
 - $Studies(Bart) \vee WatchesTV(Bart)$
 - $Hungry(Homer) \Rightarrow Eats(Homer, HotDog) \vee Eats(Homer, Pie)$
 - $\exists x Hungry(x)$
- Unfortunately, the logical approach has some drawbacks.