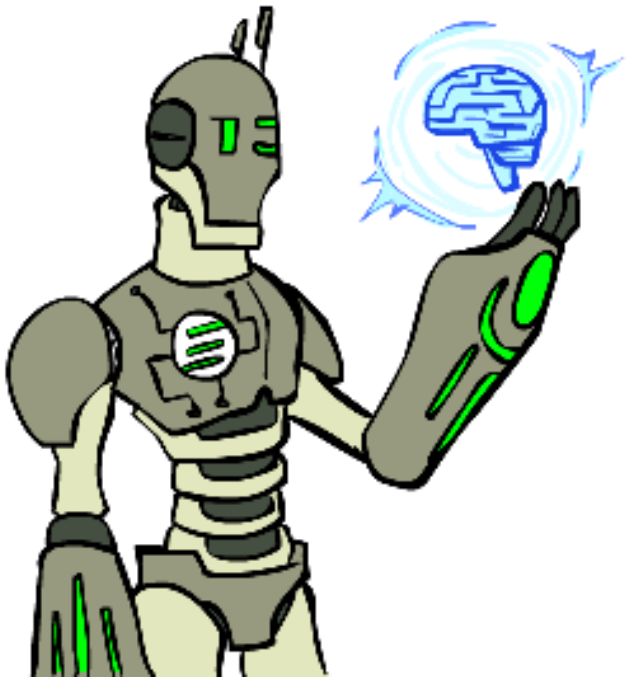
Today

- What is artificial intelligence?
- Where did it come from/ What can AI do?
  - What should we and shouldn't we worry about? What can we do about the things we should worry about?
- What is this course?



What is AI?

The science of making machines that:

- "Artificial intelligence is a computerised system that exhibits behaviour that is commonly thought of as requiring intelligence." (1)

- "Artificial Intelligence is the science of making machines do things that would require intelligence if done by man." (2)

The founding father of AI, Alan Turing, defines this discipline as:

- "AI is the science and engineering of making intelligent machines, especially intelligent computer programs." (3)

Rational Decisions

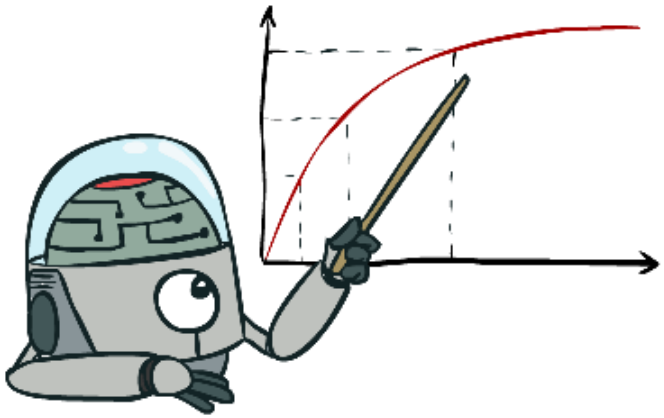
We'll use the term **rational** in a very specific, technical way:

- Rational: maximally achieving pre-defined goals
- Rationality only concerns what decisions are made
  (not the thought process behind them)
- Goals are expressed in terms of the **utility** of outcomes
- Being rational means **maximizing your expected utility**

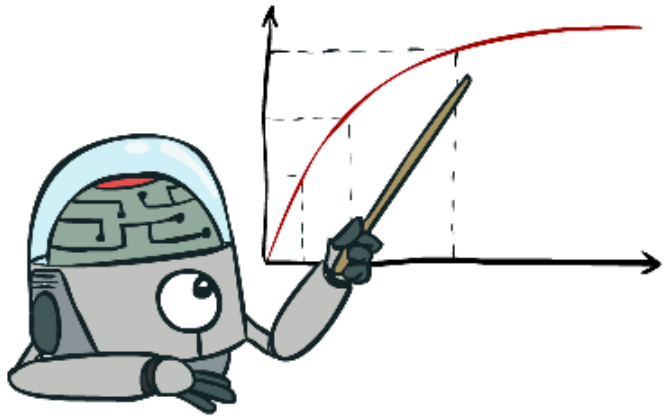
A better title for this course would be:

Computational Rationality

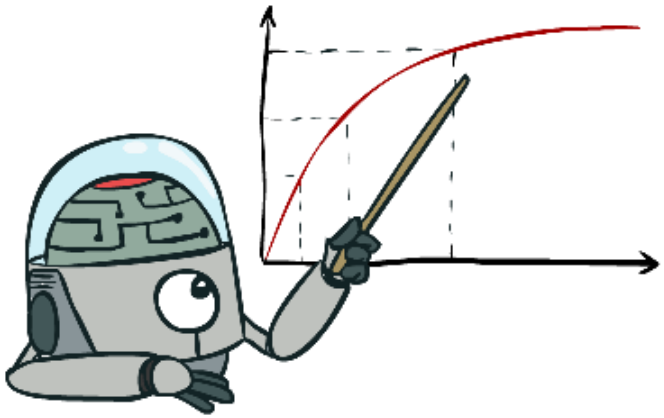
Maximize Your Expected Utility



Maximize Your Expected Utility



Maximize Your Expected Utility



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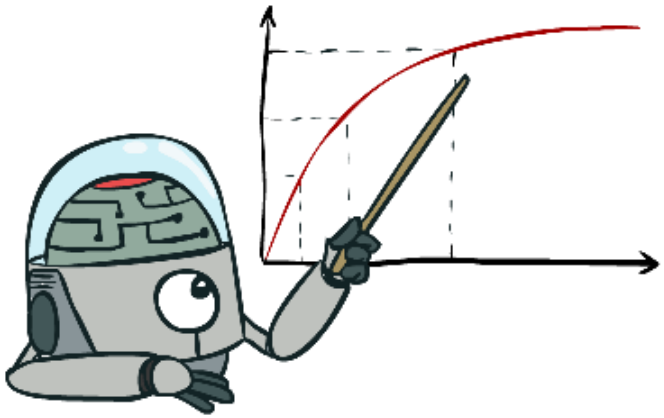

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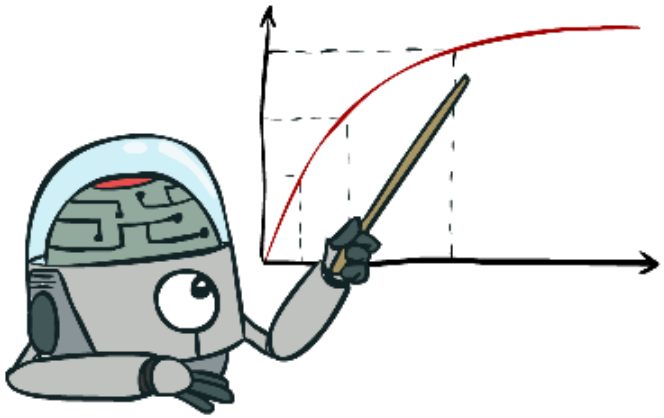

What About the Brain?

- Brains (human minds) are very good at making rational decisions, but not perfect
- Brains aren't as modular as software, so hard to reverse engineer!
- "Brains are to intelligence as wings are to flight"
- Lessons learned from the brain: memory and simulation are key to decision making

Designing Rational Agents

- An **agent** is an entity that *perceives* and *acts*.
- A **rational agent** selects actions that maximize its (expected) **utility**.
- Characteristics of the **percepts, environment,** and **action space** dictate techniques for selecting rational actions
- **This course** is about:
  - General AI techniques for a variety of problem types
  - Learning to recognize when and how a new problem can be solved with an existing technique