What is AI?

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1. "The automation of activities that we associate with human thinking, activities such as decision-making problem solving, learning.."
2. "The study of mental faculties through the use of computational models"
3. "The study of how to make computers do things which at the moment people are better"
4. "The branch of computer science concerned with the automation of intelligent behaviour"

- Thinking humanly
- Acting humanly
- Thinking rationally
- Acting rationally

Success measured in terms of human behaviour or against some ideal of rationality

If you can think intelligently, then you will act intelligently

The Turing Test
Acting humanly suggests the main components of AI
Knowledge, reasoning, language, learning

So, is this a good test of intelligence?

Not really – not reproducible and can't be mathematically analysed. Not an intelligence test.
Things that are considered intelligent like object recognition are not tested

Searle's Chinese Room

Thinking Rationally
- Derivation of conclusion from particular premises
- Various forms of logic, notation, and rules of inference
- Task or problem expressed in login -> AI program deduces solution

Problem: Difficult to express tasks in logic
Problem: How to cope with uncertainty
Problem computational expense

Acting Rationally
Acting so as to maximise goal achievement, given the available information and resources
Thought or inference not necessarily involved, e.g. reflex actions
The right thing: acting so as to maximise goal achievement, given the information and resources available

Building Rational Agents

An agent is an entity that perceives and acts
An agent can be viewed as a function from percept histories to actions
F: P -> A
Agents typically required to exhibit autonomy. For any given class of environments and tasks we seek the agents with the best performance
We want to design the best agent we can with our limited resources

Artificial Intelligence

Is the synthesis and analysis of computational agents that act intelligently

An agent acts intelligently if:
- Its actions are appropriate for its goals and circumstances
- It is flexible to changing environments and goals
- It learns from experience
- It makes appropriate choices given perceptual and computational limitations