Chapter 1: What is A

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Acting Humanly - Turing test
A Turing test is an evaluation based on a human determining if a set of specific questions is answered by a man or a computer. The test is passed if the evaluator can not determine who is answering.

To pass a Turing Test a computer must be able to do the following:

- Natural Language Processing
- Knowledge Representation
- Automated Reasoning
- Machine Learning (adapt)

However, investigators don't find it completely necessary since their goal is not always to mimic human behavior, but to explore more on the field of AI and work for an ideal standard.

Thinking Humanly - Cognitive modeling
In order to think humanly, a human mind must be understood. Such thing can be accomplished by:
Introspection: trying to catch our own thought as it goes by.
Psychological experiments: Observing a person in action
Brain Imaging: observing the brain in action.

Thinking Rationally
Dating back since ancient Greece, the concept of rational thinking is originated from logic. If A belongs to B, and B belongs to C, then A belongs to C. There are 2 main problems with this approach,

1. Informal knowledge can't be mapped to formal logical notation, specifically when knowledge is not 100% certain.
2. There is a difference between solving a problem in principle and solving it in practice.

Acting Rationally
A computer agent is expected to act and operate autonomously and perceive the environment. Correct inferences is sometimes part of being a rational agent, but not always.

Intelligence is concerned with rational action. Intelligent agents take the best possible action.

Foundations of AI

Some AI foundations are based on the idea that the mind is in some ways like a machine on the way it processes information.

Philosophy
The mind is like a machine and it operates on knowledge encoded in some internal language.
Mathematics
Provides tools to manipulate statements of logical certainty as well as uncertain, probability.
Economics
Decisions that maximize the expected outcome.
Neuroscience
Discovery of facts on how the brain works and how it relates and differs from computers.
Psychology
Humans and animals can be considered information processing machines.
Computer Engineering
Provided machines capable of running AI applications.