ARTIFICIAL INTELLIGENCE

Artificial Intelligence

- What is Artificial Intelligence?
  - The Study and Design of Intelligent Agents

- What is an Intelligent Agent?
  - A system that **perceives** its environment and **takes actions** that maximize its chances of success

Artificial Intelligence

- What is the ***environment*** of the Tic Tac Toe paper?

- What ***actions*** did it take to maximize its chances of success?

Artificial Intelligence Philosophies

- Turing
  - If a machine acts as intelligently as a human being, then it is as intelligent as a human being.
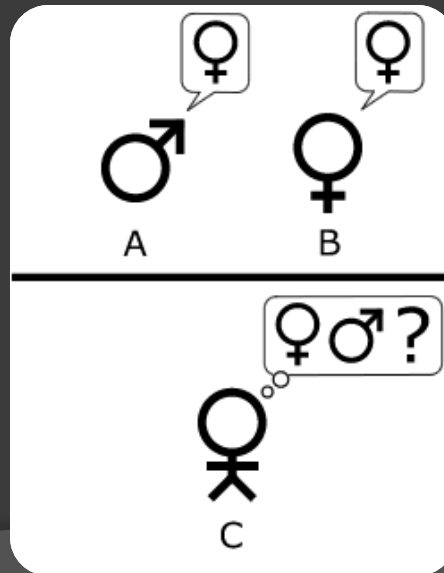   - Judge intelligence of a machine based on its behavior.

Artificial Intelligence Philosophies

- Searle
  - "The appropriately programmed computer with the right inputs and outputs would thereby have a mind in exactly the same sense human beings have minds."
  - Strong AI – a correct simulation of a mind, IS a mind
    - Machines can act intelligently, and understand in the same sense people do
  - Weak AI – a correct simulation is a model of the mind
    - Machines can only act intelligently, and thus only mimic human behavior
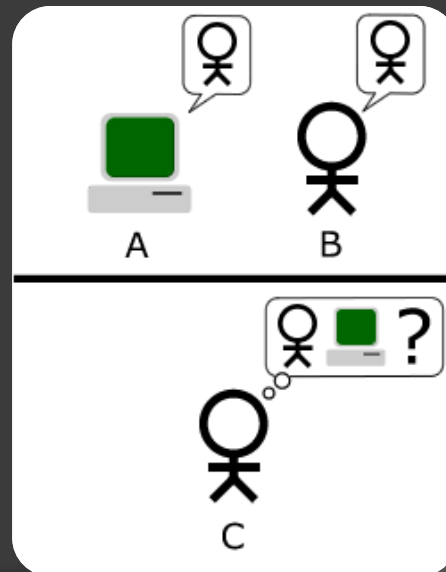
Gender Guessing Game

- Example) Determine the gender of someone in another room by conversing with them.
  - Can't ask direct answer questions (i.e. are you male/female, etc.)

Turing Test

- Measure of a computers ability to demonstrate intelligence.

- Consider the Gender Game again…

Turing Test

- If the observer cannot reliably tell the machine from a human, the machine is said to be "intelligent".
- If a machine is intelligent, it can "think"

Turing Test

- Ultimately says…

- Can computers mimic human behavior?

- This is the goal of AI

Chinese Room Test

- You write a statement in Chinese characters on a piece of paper and slide it under the door.

- You receive a response back to your statement in Chinese.

- Continue until bored.

Chinese Room Test

If you can carry on an intelligent conversation using a piece of paper slid under a door, does this imply that something inside the room understands what you are saying?

Chinese Room Test

- Who understands Chinese?

- What is the input in this test?

- What is the environment?

Strong AI vs. Weak AI

- ◉ Strong AI
  - The machine **_actually_** understands Chinese

- ◉ Weak AI
  - The machine **_simulates_** understanding Chinese

Examples

- Plen
  - http://www.youtube.com/watch?v=C_UVklCbThI
  - http://www.youtube.com/watch?v=quzwHqjgrDw&NR=1
  - http://www.youtube.com/watch?v=dnBbev4-VcE&feature=related

Examples

- Asimo
  - http://www.youtube.com/watch?v=NZngYDDDfW4
  - http://www.youtube.com/watch?v=_PMw023nS48&feature=related
  - http://www.youtube.com/watch?v=0tRo6a4VhvU

Examples

- ◉ Google Cars
  - http://www.youtube.com/watch?v=X0I5DHOETFE

Non-Robotics Examples

- Checkers

- Deep Blue

- Watson
  - http://www.youtube.com/watch?v=ZLdkJpAtt1I
  - 2:00