Artificial Intelligence

Week 1

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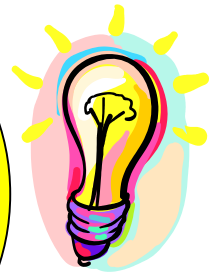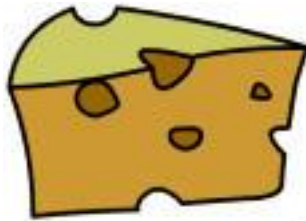**Department of Computer Science**

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Artificial Intelligence

A branch of Computer Science. Examines how we can achieve intelligent behaviour through computation.

Intelligence

- **Are the things shown below, Intelligent?**

What is Intelligence?

• **Webster says:** – The capacity to acquire and apply knowledge. – The faculty of thought and reason. – …

• What features/abilities do humans (animals/animate objects) have that you think are indicative or characteristic of intelligence?

• Abstract concepts, mathematics, language, problem solving, memory, logical reasoning, planning ahead, emotions, morality, ability to learn/adapt, etc…
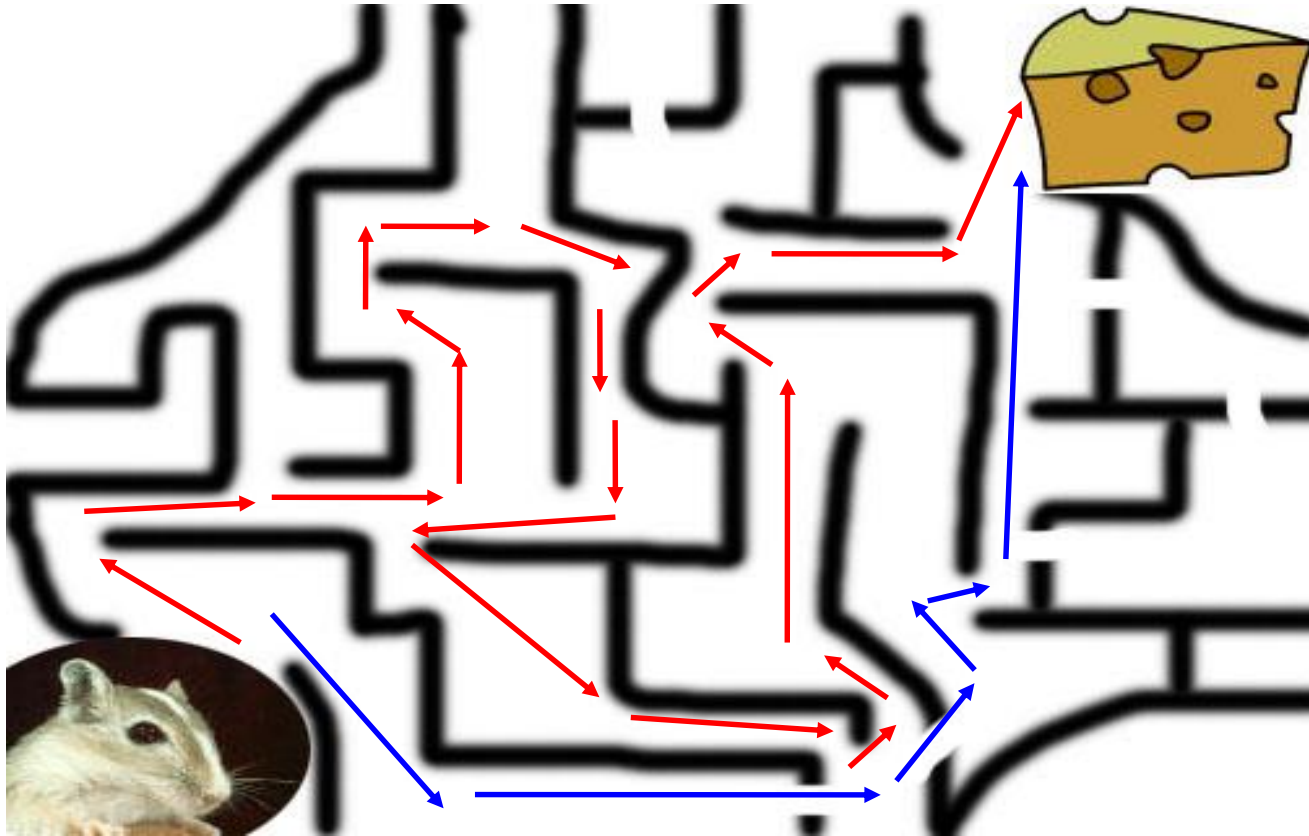
Artificial Intelligence

Studies how to achieve intelligent behavior through computational means.

This makes AI a branch of Computer Science

Why do we think that intelligence can be captured through computation?

Modeling the processing that our brains do as computation has proved to be successful. Hence, human intelligence can arguably be best modeled as a computational process.

Ex-1: Searching a path ...

Different mice might follow different paths based to their intelligence
In other words: The problem can be solved in many ways
Ability to solve problems demonstrates Intelligence

Ex-2: Next number in the sequence ...

- **Consider the following sequence ...**

$$1,3,7,13,21,\_\_$$

- ## What is the next number ?

- ## Key: Adding the next EVEN number ...

1+2 = 3; 3+4 = 7; 7+6 = 13; 13+8 =21; 21+10 = 31

1,3,7,13,21,31

Ability to solve problems demonstrates Intelligence

So, Let's Summarize…

- **Ability to solve problems**
- **Ability to plan and schedule**
- **Ability to memorize and process information**
- **Ability to answer fuzzy questions**
- **Ability to learn**
- **Ability to recognize**
- **Ability to understand**
- **Ability to perceive**
- **And many more …**

Food for thought: Can only humans beings and animals possess these qualities?

What if?

- A machine searches through a mesh and finds a path?
- A machine solves problems like the next number in the sequence?
- A machine develops plans?
- A machine diagnoses and prescribes?
- A machine answers ambiguous questions?
- A machine recognizes fingerprints?
- A machine understands?
- A machine perceives?
- A machine does MANY MORE SUCH THINGS …
- A machine behaves as HUMANS do? HUMANOID!!!