The Outline of the Course
Intelligent Agent

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At the beginning, nothing was created. The world was **shapeless** till the human being starts **learning** her/his environment. The human being, by constructing the language, step by step clusters the universe and shapes it. She/he by telling the stories (that we know call them myth) saved and protected her/his achievements obtained through interaction with world. Learning happens through interaction between the agent and the environment. By the interaction the mind of the agent establishes and the environment finds its meaning for the agent. The learning period for the human being happened in the *age of myths*. In myths age, our mind was formed by constructing symbolic forms, notions and categories through interaction with the world. After constructing symbolic forms (forming the mind), the world could eventually be **sensed** by the human being using the **symbolic forms**.

Then, the human being entered a new age called *the age of philosophy*. She/he said: "Ohh, now I have a mind". She/he discovered that she[1] is equipped by a new thing thanks to the **evolution**. She got self conscious of her MIND. She asked "what am I? What is my mind? What is the world?" **Thinking** starts. Socrates, Plato, and finally Aristotle established thinking by introducing the **logic**. Our intelligent agent starts thinking to discover **indistinct** information and pieces of the world (that was no longer shapeless).

"Let's **plan** to change the world as we desire!" Francis Bacon said, and the *age of science* started. The human being turns to thinking strategically to change the world, and not just thinking to light on **indistinct** information.

Learning, Thinking, Planning are three parts of the evolution of an intelligent agent. Besides these three parts, we consider the Smartness as well. The outline of the course is as follows:

Introduction

1. Agent, Environment, Interaction

Smartness (Problem Solving)

1. Smartness is not intelligence!
2. Solving Problem by Search Algorithms
3. Informed Search
4. Constraint Satisfaction Problem

(Exercises should be done in C++)

[1] Let me go on the story by 'she' instead of using 'she/he'.

Thinking

1. Logical Agents
2. Logical Modeling of the Environment
3. Programming in Logic
4. Theorem Proving Algorithms (propositional logic)
5. Theorem proving Algorithms (predicate logic)

(Exercises should be done in Prolog)

Planning

1. Partial Order Planning
2. Graph Plan
3. BDI Agents (1)
4. BDI Agents (2)
5. Goal Programming Language

(Exercises should be done in Goal)

Learning

1. Decision trees
2. Neural Networks
3. Reinforcement learning
4. Q- learning
5. Temporal Difference Learning
6. Monte Carlo Methods (introduction)

References

1. Michael J. Wooldridge, **Reasoning about Rational Agents**, 2000.
2. Jack Minker, **Logic Based Artificial Intelligence**, 2000
3. Steven Michael LaValle, **Planning Algorithms**, 2006
4. Ethem Alpaydin, **Introduction to Machine Learning**, 2004