



FACULTY OF MANAGEMENT SCIENCES

DEPARTMENT OF COMPUTING AND INFORMATION SCIENCES

PROGRAM: BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COURSEUNIT: ARTIFICIAL INTELLIGENCE

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QUESTION: DISCUSS UTILITY BASED AGENTS

Utility-Based Agents

Utility-Based-Agent = Goal-Based-Agent + Utility-Function

A **utility-based agent** is an agent that acts based not only on what the goal is, but the best way to reach that goal.

It is an improvement over goal based agent as it not only involves the goal but also the way the goal can be achieved such that the goal can be achieved in a quicker, safer, cheaper way.

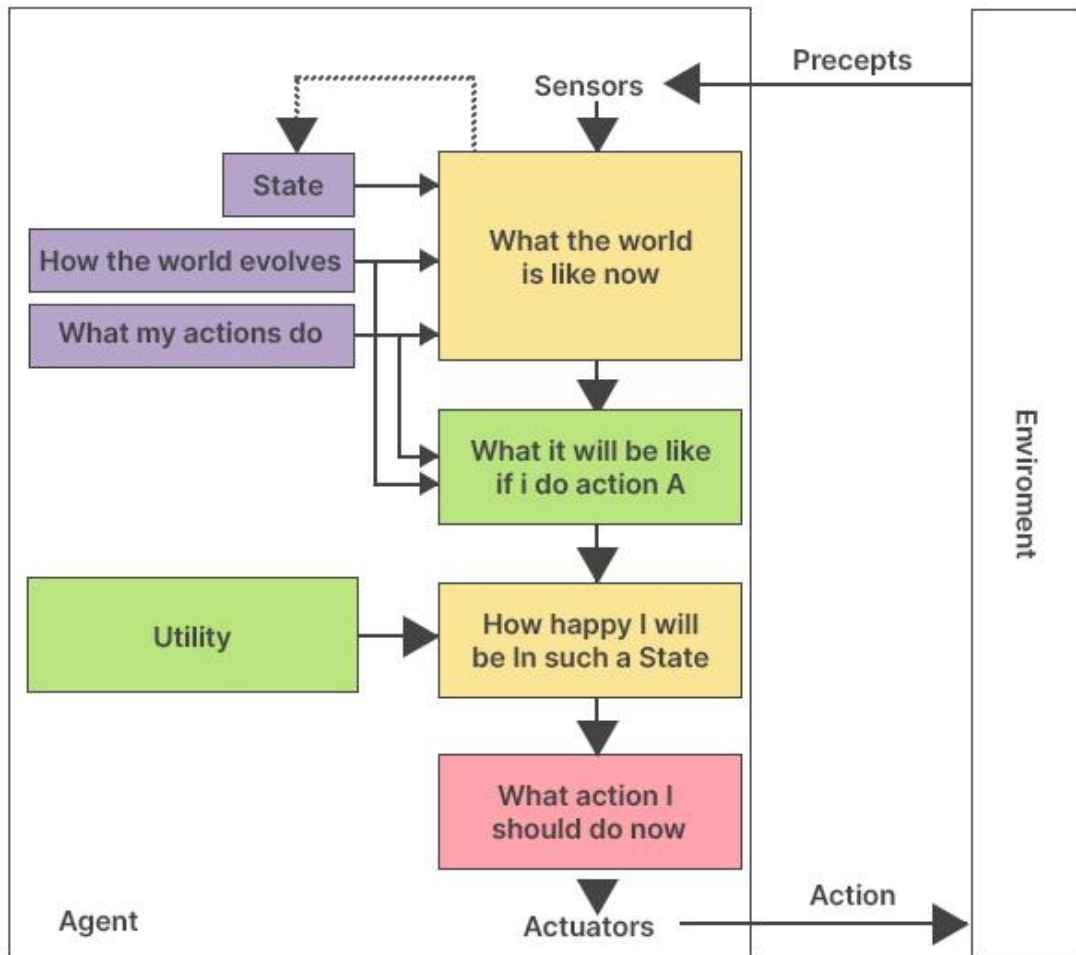
Utility agent have their end uses as their building blocks and is used when best action and decision needs to be taken from multiple alternatives. They choose actions based on a preference (utility) for each state.

The extra component of utility or method to achieve a goal provides a measure of success at a particular state that makes the utility agent different.

It takes the agent happiness into account and gives an idea of how happy the agent is because of the utility and hence, the action with maximum utility is considered. This associated degree of happiness can be calculated by mapping a state onto a real number.

Mapping of a state onto a real number with the help of utility function gives the efficiency of an action to achieve the goal.

This can be illustrated as follows:



function UTILITY-BASED-AGENT (percept) returns an action
persistent: state, the agent's current conception of the world state
model, a description of how the next state depends on current and action
utility - function, a description of the agent's utility function
plan, a sequence of actions to take, initially empty
action, the most recent action, initially none
state \leftarrow UPDATE-STATE (state, action, percept, model)
if plan is empty then
 plan \leftarrow PLAN (state, utility - function, model)
 action \leftarrow FIRST (plan)
 plan \leftarrow REST (plan)
return action

Advantages

Find best state using evaluation function or utility function
Can work efficiently in Continuous environment

Disadvantages

Limited Intelligence

REFERENCES

<https://skillx.com>

<https://www.geeksforgeeks.org>

<https://wikipedia.com>