

1. a) Thinking Humanly

"The exciting new effort to make computers think... machines with minds, in the full and literal sense."

" [The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning"

b) Thinking Rationally

" The study of mental faculties through the use of computational models"

" The study of The computations that make it possible to perceive, reason and act"

c) Acting Humanly

" The art of creating machines that perform functions that require intelligence"

" The study of how to make computers do things at which, at the moment, people are better"

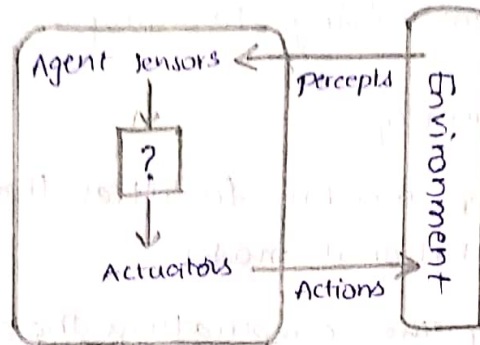
d) Acting Rationally

" Computational Intelligence is the study of the design of intelligent agents"

" AI... is concerned with intelligent behaviour in artifacts".

3. Agents and Environments

An agent is anything that can be viewed as perceiving its environment through (~~the~~) sensors and acting upon that environment through actuators.

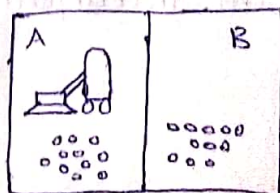


A human agent has eyes, ears and other organs for sensors and hands, legs, vocal tract and so on for actuators.


A robotic agent might have cameras and infrared range finders for sensors and switches, motors etc. for actuators.


Example for Agent & Environment

Vacuum-cleaner world



suppose this particular world has just two locations A and B.

The vacuum agent  perceives which square it is in and whether there is dirt in the square

It can ^{choose}  to move left, right, suck up the dirt or do anything.

One very simple agent function is

If the current square is dirty, then suck;
Otherwise move to the other square.

6. production rules for solving water jug problem of 2 Jugs. (one Jug has 3 capacity other Jug has 4 capacity)

S. NO	Initial state	condition	Final state	Description
1.	(x, y)	if $x < 4$	$(4, y)$	Fill the 4 gallon jug
2.	(x, y)	if $y < 3$	$(x, 3)$	Fill 3 gallon
3.	(x, y)	if $x > 0$	$(x-d, y)$	pour some water out of 4 gallon
4.	(x, y)	if $y > 0$	$(x, y-d)$	pour some water out of 3 gallon
5.	(x, y)	if $x > 0$	$(0, y)$	empty 4 gallon
6.	(x, y)	if $y > 0$	$(x, 0)$	empty 3 gallon
7.	(x, y)	if $x+y \geq 4$ & $y > 0$	$(4, y-(4-x))$	pour from 3 to 4 gallon
8.	(x, y)	if $x+y \geq 3$ and $x > 0$	$(x-(3-y), 3)$	pour from 4 to 3 gallon
9.	(x, y)	if $x+y \leq 4$ & $y > 0$	$(x+y, 0)$	pour all water from 3 to 4
10.	(x, y)	if $x+y \leq 3$ & $x > 0$	$(0, x+y)$	pour all water from 4 to 3

Solution of water jug 3 gallon, 4 gallon for goal state 2 gallon in 4 gallon (2, 4) goal

s.no	4 gallon	3gallon	Rule followed
1.	0	0	Initial state
2.	0	3	Rule no-2
3.	3	0	Rule no-9
4.	3	3	Rule no-2
5.	4	2	Rule no-7
6.	0	2	Rule no-5
7.	2	0	Rule no-9

one reaching the 7th attempt, we reach a state which is our goal state. Therefore at this stage, our problem is solved.