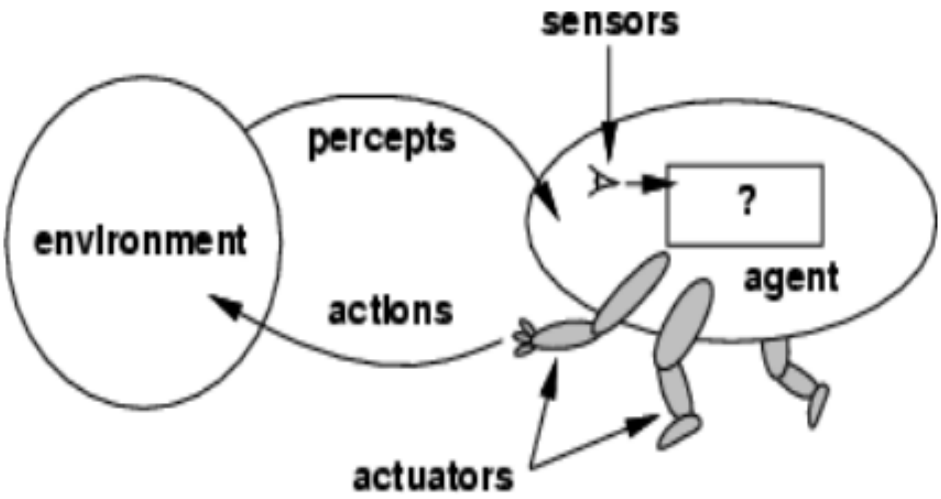
- **Structure of Intelligent Agents**



An Agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators.

A human agent has eyes, ears, and other organs for sensors and hands, legs, mouth, and other body parts for actuators.

A robotic agent might have cameras and infrared range finders for sensors and various motors for actuators.

A software agent receives keystrokes, file contents, and network packets as sensory inputs and acts on the environment by displaying on the screen, writing files, and sending network packets.

Percept: We use the term percept to refer to the agent's perceptual inputs at any given instant.

PerceptSequence: An agent's percept sequence is the complete history of everything the agent has ever perceived.

Agent function: Mathematically speaking, we say that an agent's behavior is described by the agent function that maps any given percept sequence to an action.

Agent Program: Internally, the agent function for an artificial agent will be implemented by an agent program. It is important to keep these two ideas distinct. The agent function is an abstract mathematical description; the agent program is a concrete implementation, running on the agent architecture.

To illustrate these ideas, we will use a very simple example-the vacuum-cleaner world shown in Fig 2.1.5.

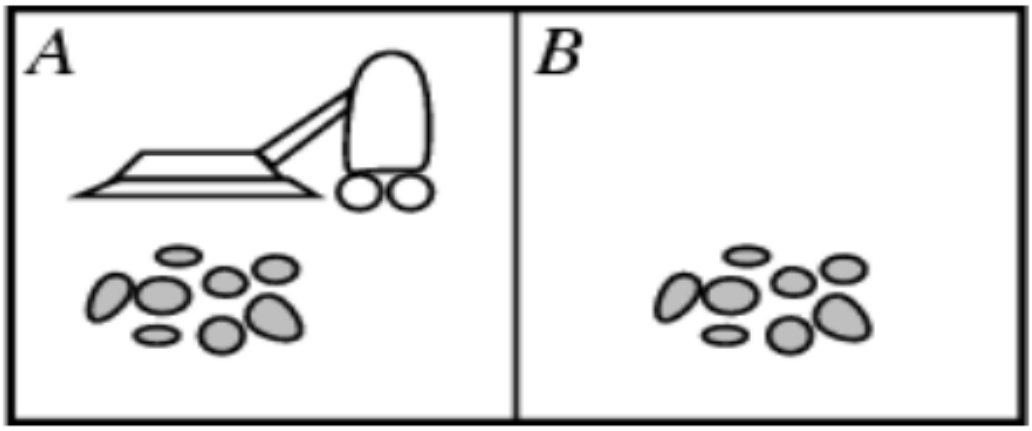


Fig 2.1.5: A vacuum-cleaner world with just two locations.

This particular world has just two locations: squares 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, move right, suck up the dirt, or do nothing. One very simple agent function is the following: if the current square is dirty, then suck, otherwise move to the other square. A partial tabulation of this agent function is shown in Fig 2.1.6.

Percept Sequence	Action
[A, Clean]	Right
[A, Dirty]	Suck
[B, Clean]	Left
[B, Dirty]	Suck
[A, Clean], [A, Clean]	Right
[A, Clean], [A, Dirty]	Suck
…	

Fig 2.1.6: Partial tabulation of a simple agent function for the example: vacuum-cleaner world shown in the **Fig 2.1.5**

- ## Characteristics of Intelligent Agents

PEAS Representation

PEAS is a type of model on which an AI agent works upon. When we define an AI agent or rational agent, then we can group its properties under the PEAS representation model. It is made up of four words:

P: Performance measure

E: Environment

A: Actuators

S: Sensors

Here performance measure is the objective for the success of an agent's behavior.

PEAS for self-driving cars:

Performance: Safety, time, legal drive, comfort

Environment: Roads, other vehicles, road signs, pedestrian