

What is AI?

Thinking humanly

Acting humanly

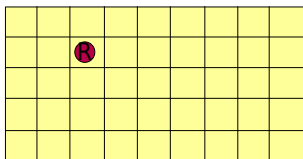
Thinking rationally

Acting rationally

Rational Agents

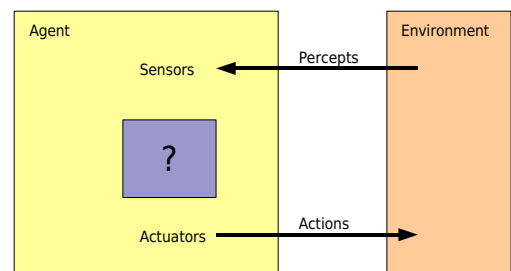
Acting Rationally

- **Rational** behavior: doing the right thing
- The right thing: that which is expected to maximize goal achievement, given the available information

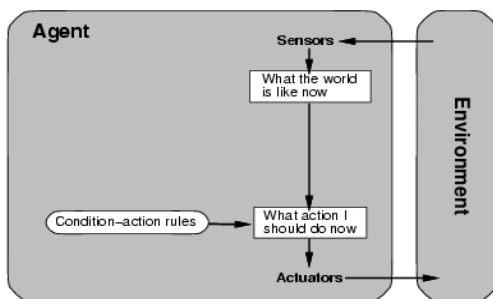


If the goal is to find a wall and follow it, and the agent can only perceive the neighboring cells, what kinds of behavior would be rational/irrational?

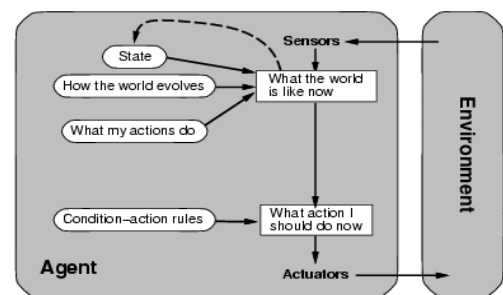
What is an agent?



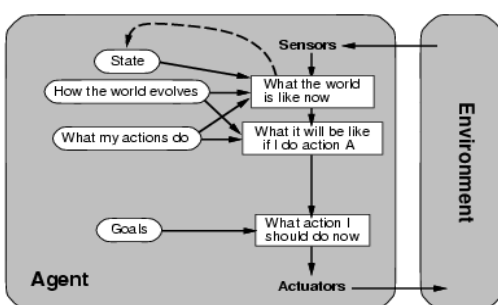
Reflex Agent or Stimulus-Response Agent



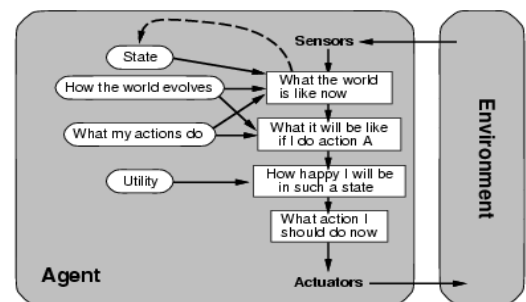
Model-based Reflex Agent



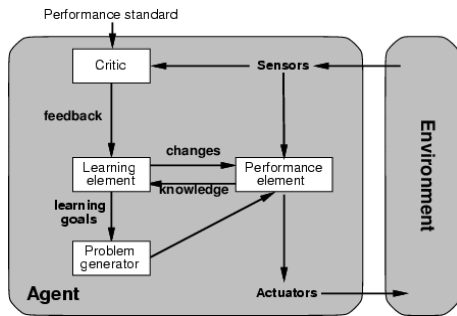
Goal-based Agent



Utility-based Agent



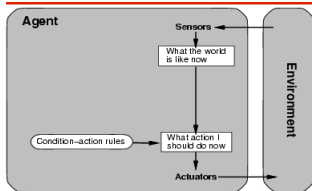
Learning Agent



Our Requirements for Intelligence

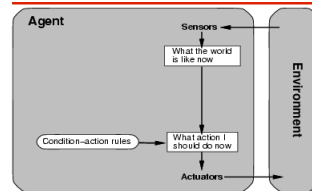
- make up new answers
- learning / adapting
- reasoning / making decisions / analyzing
- perception (body language, intonation ...)
- planning
- emotions

A Wall-following Reflex-Agent



s1	s2	s3						
s4	●	s6						
s7	s8	s9						

A Wall-following Reflex-Agent



s1	s2	s3						
s4	●	s6						
s7	s8	s9						

percepts:

[s1,s2,s3,s4,s5,s6,s7,s8,s9]

si == 'w': there is a wall at position si

si == ' ': position si is free

actions:

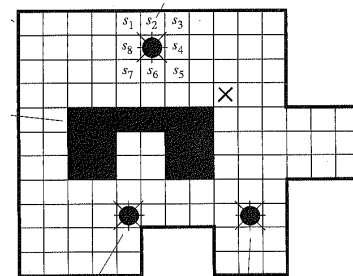
move(x) with x being north, east, south, west

The Agent Program

```

if s2 and not s6:
    move(east)
elif s6 and not s8:
    move(south)
elif s8 and not s4:
    move(west)
elif s4 and not s2:
    move(north)
else:
    move(north)
    
```

Wall-following with Obstacles



Wall-following with Obstacles (Agent Program)

```

northwall = s2 or s3
eastwall = s6 or s9
southwall = s8 or s7
westwall = s4 or s1

if northwall and not eastwall:
    move(east)
elif eastwall and not southwall:
    move(south)
elif southwall and not westwall:
    move(west)
elif westwall and not northwall:
    move(north)
else:
    move(north)
    
```

In Python: the grid world

