3 - Intelligent agents(IA)

Compile diagrams with

```
mmdc -e png --scale 3 -i diagram.md
```

Convert TikZ PDF to PNG:

```
convert -density 300 pic.pdf -quality 100 pic.png
```

Convert this markdown doc with:

```
pandoc -F mermaid-filter diagram.md -o notes.pdf
```

ToC

Intelligent agent as a function

As was described in previous lections we can describe intelligent agent as a function:

$$f : P \to A$$

, where P is a perception set(S for sensors in the image) and A is an action set.

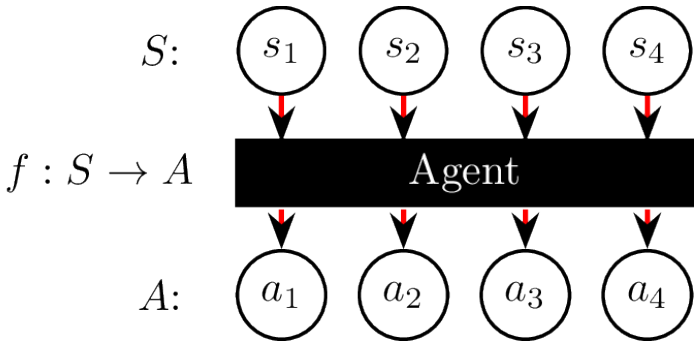


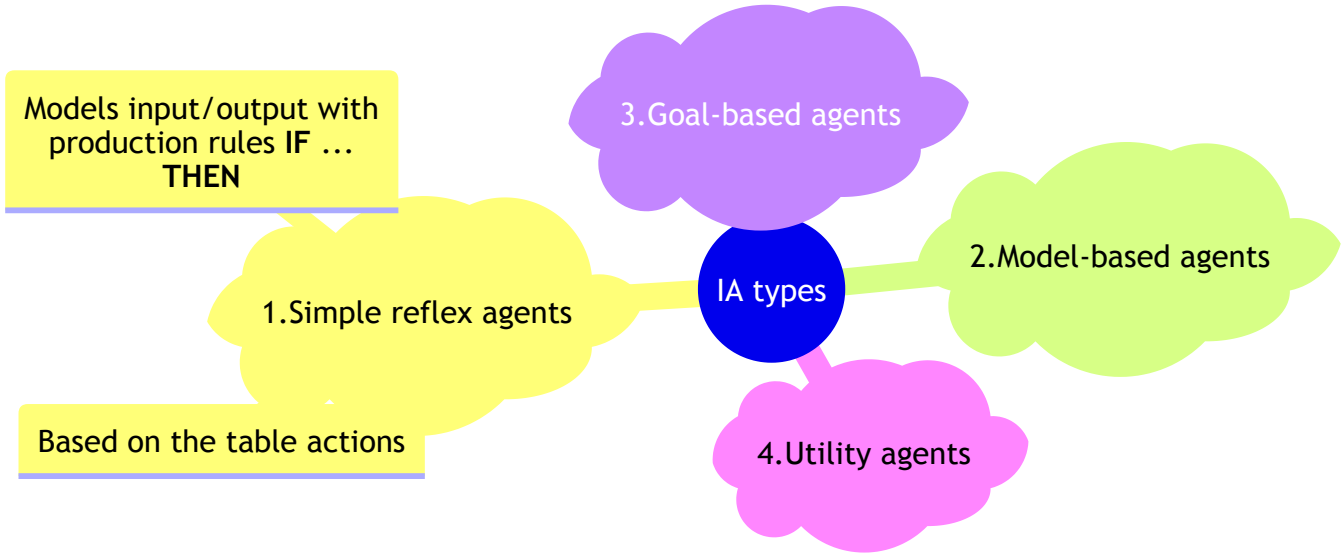
Figure 1: Agent as a function can be seen as a black box

Agent is a function that is a black box, i.e. we don't know how it produces its results. An agent receives information(perception P or S) from sensors, processes them via function(f) and returns back an action(A) to do.

The common algorithm of intelligent agent can be described as:

> function $f : P \to a \in A$ is *let* Knowledge Base : Memory(M) > $update : (M, P) \to M* >$ $action : M* \to a > update : (M*, a) \to M**$
>
> return a

Intelligent agent types



Simple reflex agents

Algorithm can be described the following way:

> function $f_r : P \rightarrow a \in A$ is $>$ *let* $PR =$ production rules - **IF** condition **THEN** action $>$ $inputinterpretation : P \rightarrow s_i \in S[state] > rulesearch : (s_i, PR) \rightarrow p_i \in PR > ruleburning : p_i \rightarrow a$
>
> return a

Illustration on working principle:

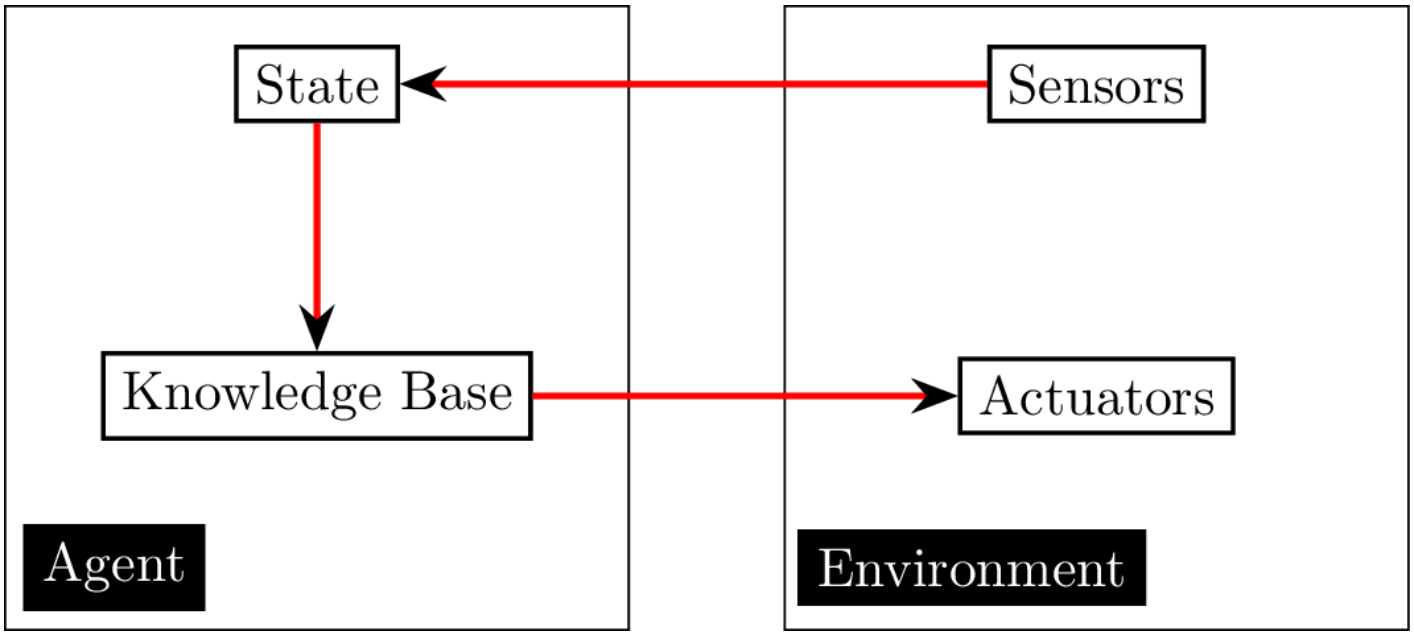


Figure 2: Simple reflex agent working principle