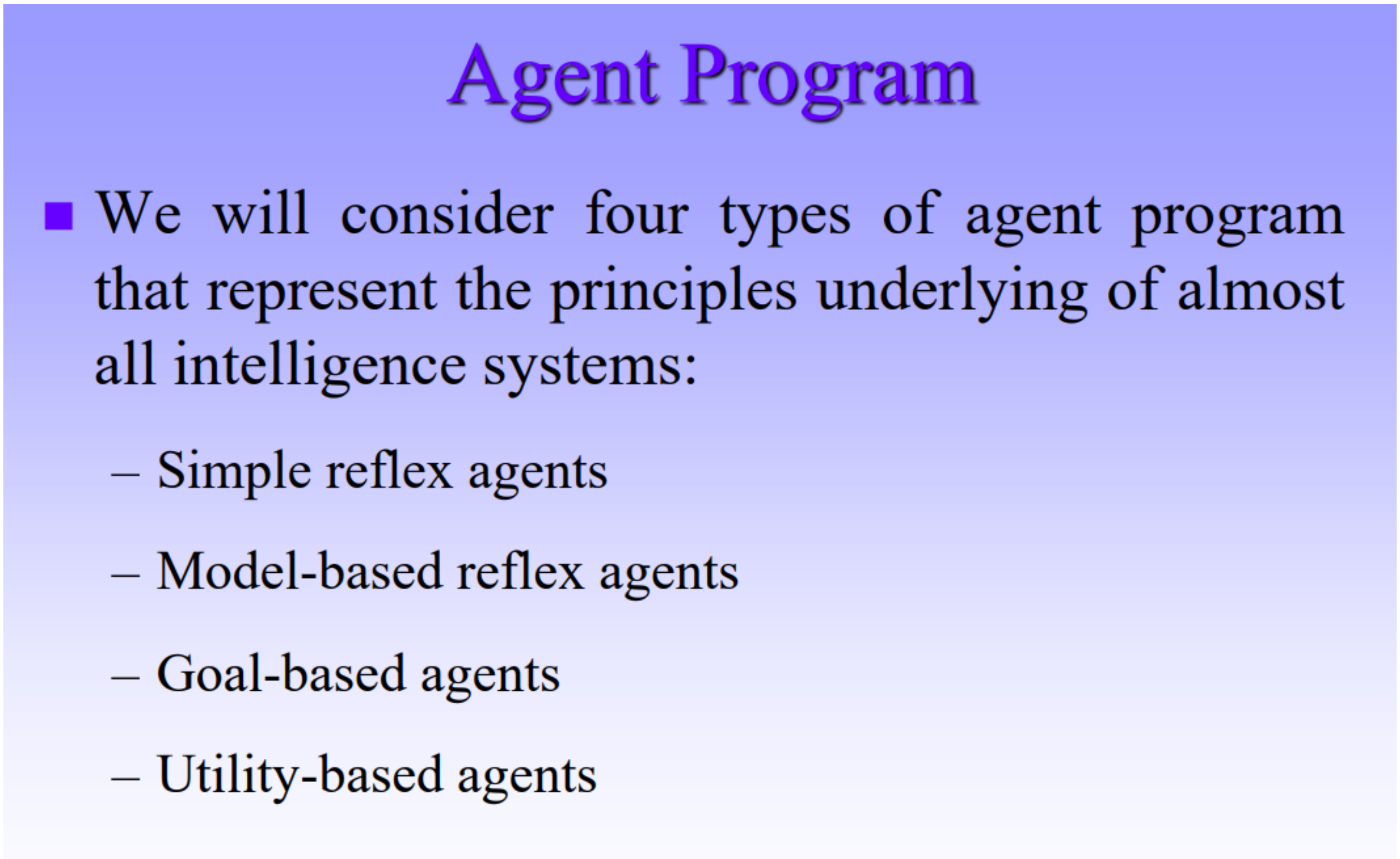
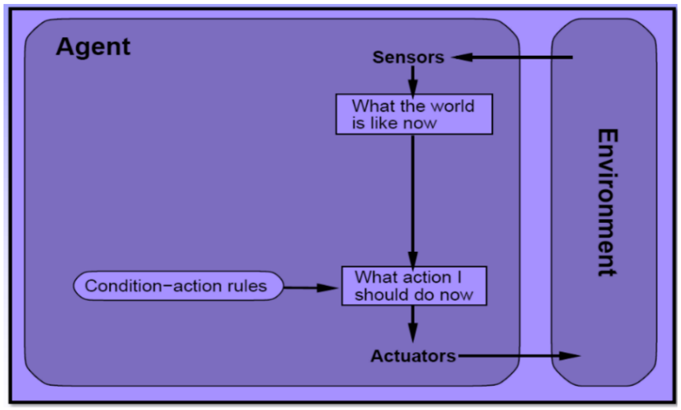
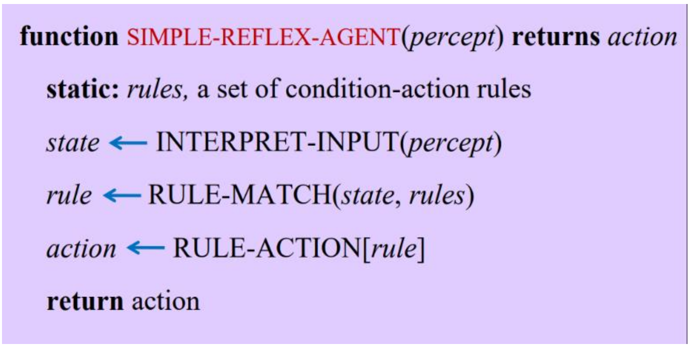
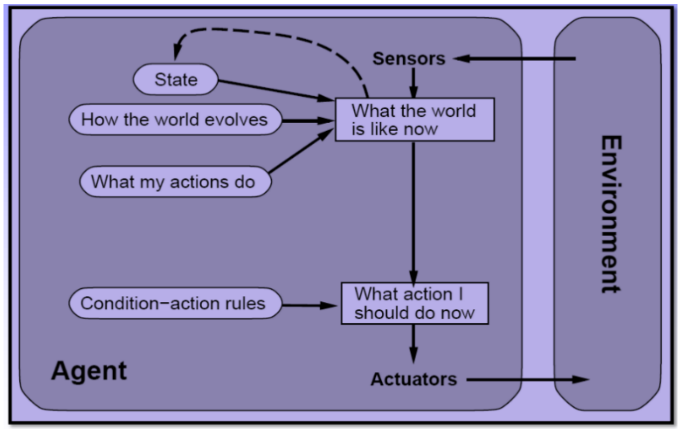
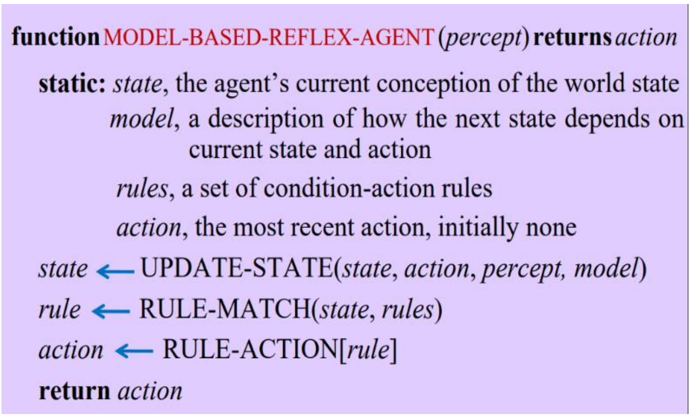
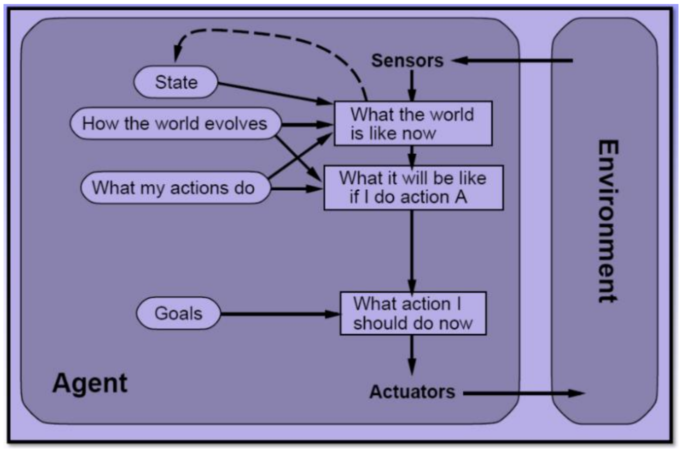
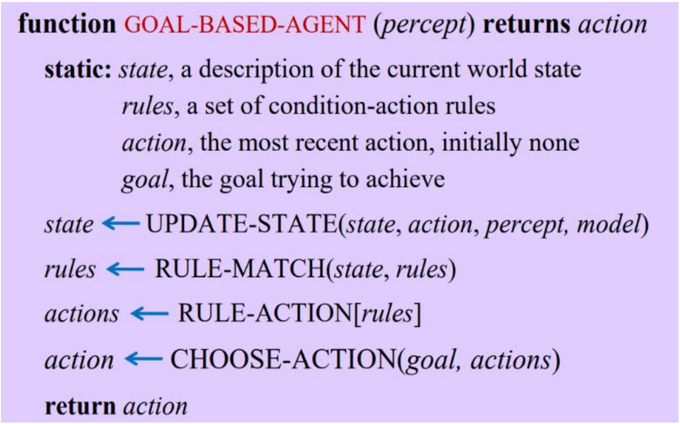
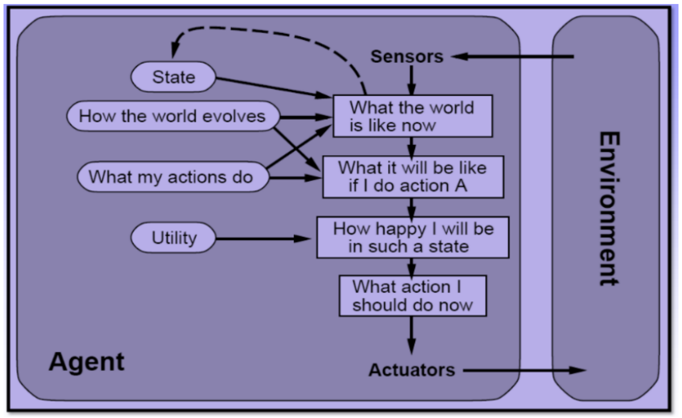
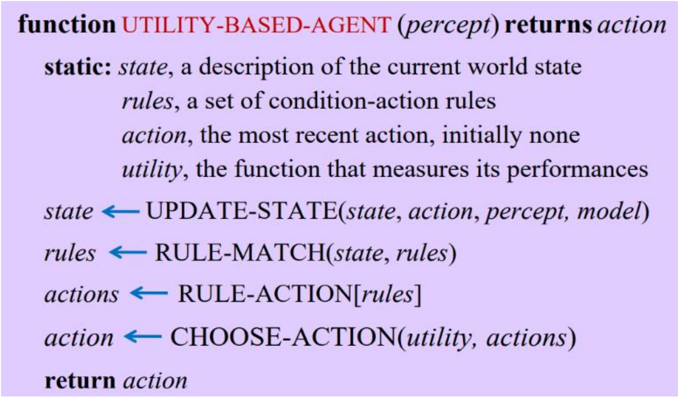


Agent Program

- We will consider four types of agent program that represent the principles underlying of almost all intelligence systems:
  - Simple reflex agents
  - Model-based reflex agents
  - Goal-based agents
  - Utility-based agents

Agent	Diagram	Code
Simple Reflex	 Agent Sensors What the world is like now Condition–action rules What action I should do now Actuators Environment	**function** SIMPLE-REFLEX-AGENT(*percept*) **returns** *action* **static:** *rules*, a set of condition-action rules *state* ← INTERPRET-INPUT(*percept*) *rule* ← RULE-MATCH(*state*, *rules*) *action* ← RULE-ACTION[*rule*] **return** action **Work only if the environment is fully observable.**
Model-based Reflex	 Sensors State How the world evolves What my actions do What the world is like now Condition–action rules What action I should do now Agent Actuators Environment	**function** MODEL-BASED-REFLEX-AGENT(*percept*) **returns** *action* **static:** *state*, the agent's current conception of the world state *model*, a description of how the next state depends on current state and action *rules*, a set of condition-action rules *action*, the most recent action, initially none *state* ← UPDATE-STATE(*state*, *action*, *percept*, *model*) *rule* ← RULE-MATCH(*state*, *rules*) *action* ← RULE-ACTION[*rule*] **return** *action*
Goal-based	 Sensors State How the world evolves What my actions do What the world is like now What it will be like if I do action A Goals What action I should do now Agent Actuators Environment	**function** GOAL-BASED-AGENT (*percept*) **returns** *action* **static:** *state*, a description of the current world state *rules*, a set of condition-action rules *action*, the most recent action, initially none *goal*, the goal trying to achieve *state* ← UPDATE-STATE(*state*, *action*, *percept*, *model*) *rules* ← RULE-MATCH(*state*, *rules*) *actions* ← RULE-ACTION[*rules*] *action* ← CHOOSE-ACTION(*goal*, *actions*) **return** *action*
Utility-based	 Sensors State How the world evolves What my actions do What the world is like now What it will be like if I do action A Utility How happy I will be in such a state What action I should do now Agent Actuators Environment	**function** UTILITY-BASED-AGENT (*percept*) **returns** *action* **static:** *state*, a description of the current world state *rules*, a set of condition-action rules *action*, the most recent action, initially none *utility*, the function that measures its performances *state* ← UPDATE-STATE(*state*, *action*, *percept*, *model*) *rules* ← RULE-MATCH(*state*, *rules*) *actions* ← RULE-ACTION[*rules*] *action* ← CHOOSE-ACTION(*utility*, *actions*) **return** *action*

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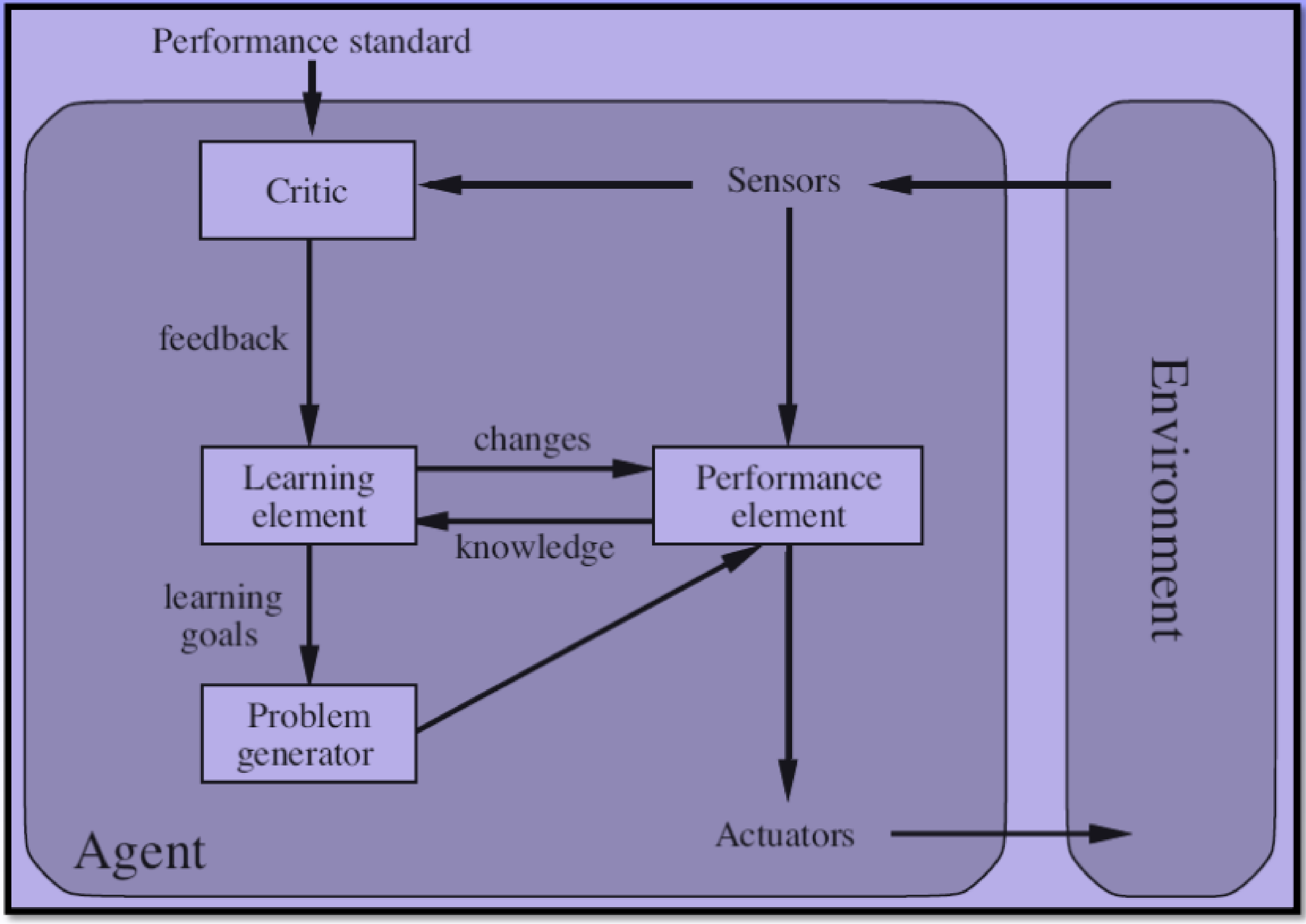
Designed by **Abdulrahman Hijazy**

Learning Agents


Performance standard
Critic
Sensors
feedback
changes
Learning element
Performance element
knowledge
learning goals
Problem generator
Environment
Agent
Actuators