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# Glossary-2

1. **Competitive Agent:** A Competitive agent is defined as the one which achieves to maximize its own utility while competing with other agents in a multi-agent environment. In case of chess playing agent, it tries to maximize its chances of winning. [1]
2. **Condition Action Rule:** A condition- action rule is defined as a look-up table is present where if a condition occurs then the following action has to be taken. Simple Reflex agents work on Condition-action Rule. [1]
3. **Environment:** The task environment is defined as a notation which specifies the performance measure, environment, actuators and sensors. The different types of environments are:
    - **Deterministic vs Stochastic:** If the next state of an environment depends on the actions executed in current state, then the environment is said to be deterministic. Otherwise, it is called a stochastic environment. [2]
    - **Discrete vs Continuous:** If an environment has a finite set of states, percepts and actions then it is said to be a discrete environment, whereas if an environment consists of states, percepts that are continuous and change over time then it is called a continuous environment. [1]
    - **Episodic vs Sequential:** If the action taken in a particular state doesn't influence the action to be taken in another state then it is called an episodic environment, whereas if actions taken in prior states influence those to be taken in next states, then it is called a sequential environment. [1]
    - **Fully vs partially observable:** If the agent's sensors give complete information about the environment at any particular point in time then it is fully observable. If the agent's sensors give only part of the environment data then it is said to be partially observable. [1]
    - **Single agent vs Multi agent:** If only a single agent is present in an environment then it is called a single agent environment whereas if several agents which may be co-operative or competitive are present in the same environment then it is siad to be in multi agent environment. [2]
    - **Static vs dynamic:** If the environment doesn't change when the agent is acting then it is called a static environment whereas if an environment is changing when an agent is acting then it is called a dynamic environment. In case of dynamic environment, the agent must keep looking at the environment even when it is deciding on an action. [1]
    - **Strategic:** An environment is considered strategic if the environment is deterministic except for the actions of other agents. The actions of an agent depend on the actions of other agents in the system. [3]

4. **Percept Sequence:** A percept sequence is defined as everything that an agent has observed till date. The complete history of everything that an agent has ever perceived is said to be percept sequence. [2]
5. **Performance Measure:** Performance measure is defined as the desirability of an action performed by an agent in an environment. It defines the criteria required by an agent to be successful in an environment. [1]
6. **Omniscience:** Omniscience is defined as an agent knows everything about the actual result of actions in an environment. So, an omniscience agent acts according to the results of actions as needed which is impossible in reality. [1]
7. **Utility Function:** Utility Function is defined as an internal representation of performance measure in a utility based agent. If both internal utility function and external performance measure are in resonance then an agent always tries to maximize its utility function which means it tries to achieve better performance measure in an environment. [1]

**References:**


[1] Artificial Intelligence, A Modern Approach (AIMA), Third Edition, 2010 by Russell & Norvig.

[2] Course Handouts of CSCE 876, Fall 2017, by Prof. Berthe Choueiry

[3] Miami university computer science, retrieved from http://www.cs.miami.edu/home/geoff/Courses/COMP6210-10M/Content/EnvProb.shtml