**Performance Measure:** An objective standard (utility function) for judging whether an agent's activity was successful.

**Utility Function:** A function that converts potential outcomes into utility values can be used to determine an AI agent's preferences; the greater the value, the more the agent likes the potential outcome.

**Commonalities between Performance Measure and Utility Function:**

|  |  |
| --- | --- |
| **Performance Measure** | **Utility Function** |
| It’s a function | It’s a function |
| Could be the same result as a utility function in some cases. | Could be the same result as a performance measure in some cases. |
| Define the success of the agent | Define the success of the agent. |

**Difference between Performance Measure and Utility Function:**

|  |  |
| --- | --- |
| **Performance Measure** | **Utility Function** |
| An impartial observer assesses an agent's effectiveness using a performance measure. | An agent uses a utility function to assess how desirable states or histories are. |
| The function goes from historical data to an actual value. | A mapping of states onto real numbers. |
| Just Evaluation of success. | Evaluation of the tradeoffs among conflicting goals. |
| The utility function and the performance measure could not be the same. | |
| e.g., Performance Measure for Chess Games is (Win, Loss, Draw) | The Utility function gives the success value for can be a Relational Agent. |
| There is no evaluation for success that how well the success is. | A large value means the agent gives the potential outcome |