Decision Systems

Before we can discuss decision systems we must first look at what makes an AI work - what are its parts.

This is possible because of the following systems:

- **The Brain**: it's responsible with the decision making
- **The Senses** (or sensors): are the AI's way of detecting enemies, obstacles and more. They are linked with the brain to provide the accurate information in real time
- **The Body**: receives actions from the Brain and executes them
- **The Legs**: are used to move the character. They implement special pathfinding algorithms that compute the route from A to B for the AI to take

Let's focus on the brain of the AI - the decision systems.

Finite State Machines - This AI is used a lot. Actions are mapped to states and the AI can be in a particular state at a specific time. The states are interconnected together with transitions that get triggered when a particular change happens to the agent.

Games: DOOM, Quake

Behavior Trees - BTs are very common in most game engines, having direct integration in Unreal Engine. Their main selling point is that a designer can create an AI system without having to interact with any code piece.
They are also very flexible to use.

Games: HALO

Planning - This one is very similar to the State Machines, but the main difference is that the states are not connected between them. This gives total freedom for the AI to pick any available option.

Games: FEAR

Utility AI - The Utility AI does not have a particular structure, but rather a set of rules. It's mostly used to handle complex actions like an RPG character that has multiple skills and needs to pick one or another based on the current situation.

Games: Dragon Age: Inquisition