

EXPLAIN ***IN YOUR OWN WORDS (not from the internet)***

**Constraint Satisfaction Problem**

We can employ an existing technique—constraint satisfaction problems—to assist us to address AI planning challenges, just like AI planning for satisfiability. In this way, we can resolve our AI planning issues using established, highly researched algorithms for CSPs.

### **Explanation**

Constraint fulfillment is the process of locating a solution through a set of restrictions that establish requirements that the variables must meet in artificial intelligence and operations research.

 A point in the feasible zone, or a collection of values for the variables, that meet all constraints, is referred to as a solution.

Depending on the type of constraints being taken into account, different constraint satisfaction strategies are utilized.

### **Step 2 of 3**

The significance of the constraint satisfaction problem

Constraint fulfillment is the process of locating a solution through a set of restrictions that establish requirements that the variables must meet in artificial intelligence and operations research.

In a constraint fulfillment problem on such a domain, there are several variables whose values can only be derived from the domain, as well as several constraints, each of which specifies the permitted values for a certain group of variables. An evaluation of the variables that comply with all restrictions is a solution to this issue.

### **Step 3 of 3**

**Example:**

A crossword puzzle, for instance, merely requires that words that cross each other have the same letter in that particular spot. If we stipulated that we could only use, say, 15 vowels, it would be a generic search problem.

Examples from "real life" include resource allocation and product configuration.

A CSP can be viewed as a decision problem with a solution, for example. This can be discovered by conducting a comprehensive search and either finding a solution or not (stochastic algorithms typically never reach an exhaustive conclusion, while directed searches often do, on sufficiently small problems). Depending on the situation, it's feasible that the CSP provides solutions thanks to another mathematical inference technique.

##### Final Answer

Each variable in a constraint satisfaction problem (CSP) must be given a value chosen from a predetermined limited domain to satisfy the constraints related to the variables. Scheduling and timetabling are two examples of combinatorial issues in operational research that can be expressed as CSPs.