Liam Fitting

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Artificial Intelligence

Constraint Satisfaction Problems

For the first problem let's assume you are an employer with a set of workers that can do jobs containing a particular skill: painting, carpentry, and/or plumbing. In this scenario you will have three workers: Alice, Bob, and Charlie. The constraints are these: Each worker must be assigned to exactly one job. Each Job must have exactly one worker. Alice can do carpentry, Bob can do carpentry or painting, and Charlie can do plumbing. This model can be scaled up or down to any businesses needs to ensure profit maximizing and resource efficient practices.

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Job Assignment Problem:

{'Charlie': 'Plumbing', 'Alice': 'Painting', 'Bob': 'Carpentry'}

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The second problem is something that is applicable to many places in the EU and Spain. It is a train scheduling issue. You have three trains that need to arrive and depart at a station. There are three time slots that a train can “occupy”: morning, afternoon and evening. The constraints are these: two trains cannot use the same track at the same time (otherwise they crash), train T1 must arrive before train T2 and train T3 must depart after Train T1. This example lets you keep track of it mentally because it’s not a large search space but this can easily be modified for a train station to coordinate hundreds of trains.

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Train Scheduling Problem:

{'T1': 'Morning', 'T2': 'Afternoon', 'T3': 'Evening'}
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