1. For problem 1,

Variables are 4 people, domain values are the jobs that could be assigned.

Solution for problem 1:

{Steve=[police officer, nurse], Pete=[clerk, boxer], Thelma=[actor, chef], Roberta=[teacher, guard]}

State search: 363 and 8 for without and with MRV respectively.

1. From problem2,

I represent the game in the following table:

This is solution for this problem.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [**House**](https://en.wikipedia.org/wiki/House) | **1** | **2** | **3** | **4** | **5** |
| [**Color**](https://en.wikipedia.org/wiki/Color) | [Yellow](https://en.wikipedia.org/wiki/Yellow) | [Blue](https://en.wikipedia.org/wiki/Blue) | [Red](https://en.wikipedia.org/wiki/Red) | [Ivory](https://en.wikipedia.org/wiki/Ivory) | [Green](https://en.wikipedia.org/wiki/Green) |
| [**Nationality**](https://en.wikipedia.org/wiki/Nationality) | [Norwegian](https://en.wikipedia.org/wiki/Norway) | [Ukrainian](https://en.wikipedia.org/wiki/Ukraine) | [Englishman](https://en.wikipedia.org/wiki/Englishman) | [Spaniard](https://en.wikipedia.org/wiki/Spaniard) | [Japanese](https://en.wikipedia.org/wiki/Japan) |
| [**Drink**](https://en.wikipedia.org/wiki/Drink) | [**Water**](https://en.wikipedia.org/wiki/Water) | [Tea](https://en.wikipedia.org/wiki/Tea) | [Milk](https://en.wikipedia.org/wiki/Milk) | [Orange juice](https://en.wikipedia.org/wiki/Orange_juice) | [Coffee](https://en.wikipedia.org/wiki/Coffee) |
| [**Eat**](https://en.wikipedia.org/wiki/Smoke) | Kits Kats | Hershey bars | Smarties | Snickers | Milky Ways |
| [**Pet**](https://en.wikipedia.org/wiki/Pet) | [Fox](https://en.wikipedia.org/wiki/Fox) | [Horse](https://en.wikipedia.org/wiki/Horse) | [Snails](https://en.wikipedia.org/wiki/Snails) | [Dog](https://en.wikipedia.org/wiki/Dog) | [**Zebra**](https://en.wikipedia.org/wiki/Zebra) |

So the answer to the game is:

[Norwegian](https://en.wikipedia.org/wiki/Norway) drink water, and Japanese has Zebra as pet.

State search: 205 and 590 for without and with MRV respectively.

It is quite weird that for problem 2, the problem search more states with MRV heuristic.

For the consistency function, each time, I assign a value to a variable, I will call the consistency function to check that whether this is a valid assignment.