# Observations

MRV performed about 3 times faster to the regular back-tracking algorithm.

|  |  |  |
| --- | --- | --- |
| **# iterations** | **without MRV** | **with MRV** |
| **Jobs puzzle** | 24 | 8 |
| **Houses Puzzle** | 180 | 62 |

# Choice of representation

## Jobs puzzle

### Variables

I used an array ‘person[8]’ to represent the person assigned for each job.

### Consistency function

Here I check if all the constraints given in the problem are satisfied, if any of them is not satisfied, the function returns false.

## Houses puzzle

### Variables

I used a 2-dimentional array ‘assignment[5][5]’ to represent the assignments; the first dimension is used to denote the house in the order from left to right, the second dimension is used to denote the properties of the house (in the order: pets, colors, nations, drinks, chocolates). The value of assignment[i][j] represents the assignment for the ith house’s jth property, which is equal to the assignment[i][j]th value of the jth property (the order and values of the properties are stored in maps).

### Consistency function

Here I check if all the constraints given in the problem are satisfied, if any of them is not satisfied, the function returns false.

## MRV function

The function restricts the variables based on the given constraints and the partial assignment.

# Program Outputs

## Jobs puzzle - without MRV

Found the following mapping!

chef is held by Thelma

guard is held by Roberta

nurse is held by Steve

clerk is held by Pete

police is held by Steve

teacher is held by Roberta

actor is held by Thelma

boxer is held by Pete

Number of iterations: 24

## Jobs puzzle - with MRV

Found the following mapping!

chef is held by Thelma

guard is held by Roberta

nurse is held by Steve

clerk is held by Pete

police is held by Steve

teacher is held by Roberta

actor is held by Pete

boxer is held by Thelma

Number of iterations: 8

## Houses puzzle - without MRV

Found the following mapping!

PET COLOR NATIONALITY DRINK CHOCOLATE

--------------------------------------------------------------------------------------------------------------

House#1 fox yellow Norwegian water Kit Kat

House#2 horse blue Ukrainian tea Hershey

House#3 snail red Englishman milk Smarties

House#4 dog ivory Spaniard juice Snickers

House#5 zebra green Japanese coffee Milky Way

Number of iterations: 180

## Houses puzzle - with MRV

Found the following mapping!

PET COLOR NATIONALITY DRINK CHOCOLATE

--------------------------------------------------------------------------------------------------------------

House#1 fox yellow Norwegian water Kit Kat

House#2 horse blue Ukrainian tea Hershey

House#3 snail red Englishman milk Smarties

House#4 dog ivory Spaniard juice Snickers

House#5 zebra green Japanese coffee Milky Way

Number of iterations: 62