CSC 420 - Assignment 4

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1 Question 1

The Magic 3x3 Square is a 3x3 grid of the digits 1 to 9. Each grid cell has a unique number, and when arranged in a certain order, the sum of each row, column, and diagonal will each be 15.

Consider the following square, with letters marking each grid tile, and a possible solution:

A	B	C
D	E	F
G	H	I

6	1	8
7	5	3
2	9	4

This problem can be formulated as a Constraint Satisfaction Problem, with the following properties:

- Variables: $X =$ { A, B, C, D, E, F, G, H, I }
- Domains: $X_i =$ { 1, 2, 3, 4, 5, 6, 7, 8, 9 }
- Constraints: $C =$ {
  - AllDifferent{ A, B, C, D, E, F, G, H, I },
  - A + B + C = 15,
  - D + E + F = 15,
  - G + H + I = 15,
  - A + D + G = 15,
  - B + E + H = 15,
  - C + F + I = 15,
  - A + E + I = 15,
  - C + E + G = 15 }

2 Question 2

The attached MiniZinc script produces the following output:

```
Running Magic15Square.mzn
847msec

4 9 2
3 5 7
8 1 6
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Finished in 847msec.
```