FIT5216: Modelling Discrete Optimization Problems
Inclass Task 12: Lineup

1 Problem Statement

The lineup problem is a simple satisfaction problem. Given a set of people `PERSON` line then up in an order so that each pair is *compatible*. A pair of persons is compatible iff

- their age differs by at least 10 years,
- their gender differs, or
- their height differs by at least 10cm

The data for the problem is given in the format

```
enum PERSON;
enum GENDER = { Male, Female, Other};
array[PERSON] of int: age;
array[PERSON] of int: height;
array[PERSON] of GENDER: gender;
```

The model for the problem is given already, it is

```
set of int: POS = 1..card(PERSON);
array[POS] of var PERSON: person;
% each person appears in exactly one position
include "alldifferent.mzn";
constraint alldifferent(person);
% each two adjacent people are compatible
constraint forall(i in 1..card(PERSON)-1)
                 (compatible(person[i],person[i+1]));
% Two people are compatible iff
%     + their ages differ by at least 10
%     + their genders are different, or
%     + their heights differ by at least 10
predicate compatible(var PERSON: p1, var PERSON: p2);
```

You simply need to fill in the definition of `compatible`.

Once you have succeeded, count the number of solutions for the given data file `10.dzn`.

2 Instructions

Edit the provided `mzn` model files to solve the problems described above. Your implementations can be tested locally by using the *Run* icon in the MiniZinc IDE or by using,

```
minizinc ./modelname.mzn ./datafile.dzn
```

at the command line.