# Modeling Discrete Optimization Workshop:
# **Simple Puzzles**

## 1 Introduction

The aim of this workshop is to build MiniZinc models to solve the following problems. They are not too big, it is simply an exercise to get used to MiniZinc and capturing models from descriptions.

### 1.1 The Abbot's Puzzle - `abbot.mzn`

If 100 bushels of corn were distributed among 100 people in such a manner that each man received three bushels, each woman two, and each child half a bushel, how many men, women, and children were there given there are five times as many women as men?

### 1.2 Who is Lying - `lying.mzn`

Huey, Dewey and Louie are being questioned by their uncle. These are the statements the make:

- Huey: Dewey and Louie has equal share in it; if one is guilty, so is the other.
- Dewey: If Huey is guilty, then so am I.
- Louie: Dewey and I are not both guilty.

Their uncle, knowing that they are cub scouts, realises that they cannot tell a lie. Has he got sufficient information to decide who (if any) are guilty?

### 1.3 Knights and Knaves - `knk1.mzn, knk2.mzn`

On the island of knights and knaves all knights always tell the truth and all knaves always lie. Each native of the island is either a knight or a knave.

A visitor meets three natives who make the following statements:

A : Exactly one of us is a knave

B : Exactly two of us are knaves

C : All of us are knaves

What type is each native?

A visitor meets three other natives who make the following statements:

D : Exactly one of us is a knight

E : Exactly two of us are knights

F : All of us are knights

What information can the visitor gain from this?

## 2 Technical Requirements

For completing the workshop you will need MiniZinc 2.0 (`http://www.minizinc.org/2.0/`).