M4CO Project Plan

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We are interested in solving the following problems. The first one is from earlier work place and the second one from csplib.org. We would prefer working on the first problem but if it is considered too easy, we propose the second problem as a back-up option.

1 Problem 1

Consider a workplace with n employees where you work in teams of three (or teams of k...), and the job entails driving. Thus, assuming for the moment that $n \in \mathbb{Z}/(3)$ (or $\mathbb{Z}/(k)$), there need to be at least $n/3$ persons among the n who have drivers licenses. So, $n/3 \leq d \leq n$, one might say.

To make this an optimization problem, we make the realistic assumption that not everyone at the workplace get along. We introduce a "preference matrix" P of size $n \times n$; P_{ij} would indicate how willing i would be to work with j. P wouldn't necessarily be symmetric. The preference matrix could be designed in several ways, but the problem would be posed as follows: find one/all partition(s) of n employees into teams of three/k such that

1. each team has (at least) one driver, and
2. worker satisfaction is maximized

2 Problem 2

From csplib.org problem 011 - ACC basketball schedule. We think this problem is well defined and Pierre introduced us to sport scheduling during lectures so this problem would deepen our knowledge on that subject. Solving times for this problem have developed from 24 hours down to under one second and we think it would be interesting to see how well we would do with miniZinc model. There currently exists no miniZinc solution to this problem.