Team 3
Project Presentation

Kristian Järvenpää – Erik Vesterlund

January 12, 2017

Problem statement

Divide n workers into t teams of size m such that each team has at least one member that has a driver's license, of which there are $d \geq t$ in total.

Each worker prefers to work with some more than others, this is recorded in an $n \times n$ preference matrix P.

Find the team division such that average satisfaction is maximal and no one has to work with his least favorite colleague.

Model

Straightforward translation from math to MiniZinc. A solution is an array of length n, first m entries are one team, second m entries another, etc.

Symmetry-breaking: disallow permuting the teams and the order of workers in a team.

Results

Technology	LCG		CBLS		Hybrid	
Solver	Chuffed		OscaR		MinisatID	
Instance (n)	sol	time	sol	time	sol	time
9	**3**	2.55	3	TO	3	TO
15	**3**	77.36	7.4	TO	5.5	TO
21	–	TO	17.2	TO	15.3	TO
27	–	TO	–	TO	27.3	TO

Table: Results of model tested on different solvers, 90 s timeout.
Solution range is $[3, 2n + 1]$ when $m = 3$

Extended timeout

Solver	MiniSAT	
Instance (n)	sol	time
9	3	TO
15	4.8	TO
21	15.1	TO
27	26.7	TO

Table: Results of model tested on MiniSAT, 120 s timeout. Solution range is $[3, 2n + 1]$ when $m = 3$

Difficulties

How get an instance of P? MiniZinc generates "artifical" instances, and handpicking an instance from "all" outputs wasn't doable for large n.