

## Week 6 – Modelling Examples

### Minimax

Suppose we want to find the solution that minimises

$$\max_i \sum_j c_{ij} x_j$$

How can we do this using linear programming?

### Sudoku

Consider the following puzzle (the ‘Tough Sudoku’ for April 22<sup>nd</sup> from [sudoku.com.au](http://sudoku.com.au)):

			1			7		
9				3	7			
4					6		2	
2		3						
	5						7	
						5		9
	1		6					3
			8	1				4
		5			9			

Sudoku provided by [Sudoku.com.au](http://Sudoku.com.au)

Formulate an integer programming problem that will solve this Sudoku puzzle.

## **English-14**

Suppose you want to write in English but have to restrict yourself to just 14 letters. You can choose any 14 but then you can only use words made up of those letters. Which 14 letters would you choose?

## **Minimising Absolute Error**

In regular least squares fitting for data we choose a line to minimise the sum of the squared vertical distances of points from the line. This has a nice solution but can be badly affected by large deviations.

A more robust approach is to minimise the absolute error between points and the line. How can we do this using linear/integer programming?