

# Advanced Programming

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### Exercise 4

# What do do?

Write a program in C, which enumerates all solutions to a binary program of the form:

$$Ax \leq b, x \in \{0, 1\}$$

with  $A$  being a  $m \times n$  matrix, and  $b$  a  $m$  vector, with  $m, n \leq 32$ .

Example:

$$\begin{array}{rcl} 2x_1 + 3x_2 + 5x_3 - 4x_4 & \leq & 8 \\ 3x_1 - 6x_2 + 8x_4 & \leq & 10 \\ x_3 + x_4 & \leq & 1 \end{array}$$

The input format for the above would be:

```
4 # columns (variables)
3 # rows (constraints)
2 3 5 4 <= 8
3 6 0 8 <= 10
0 0 1 1 <= 1
```

Everything after an `#` in a line should be discarded as a comment.  
The program should read the data from a file and write out all solution vectors.  
Be aware that we will continue to work on this program and change and extend it further.