Solution to Homework 34

Homework 34. On the example of the formula $(a \vee b \vee \neg c) \,\&\, (\neg a \vee \neg b)$, show how checking its satisfiability can be reduced to an instance of the subset sum problem (i.e., the problem of exact change).

Solution. In the above 3-CNF formula, we have:

- three Boolean variables a, b, and c (so that $\ell = 3$), and
- $k = 2$ clauses $C_1 = a \vee b \vee \neg c$ and $C_2 = \neg a \vee \neg b$.

By applying the general algorithm, we get the following table:

	a	b	c	C_1	C_2
a	1	0	0	1	0
$\neg a$	1	0	0	0	1
b	0	1	0	1	0
$\neg b$	0	1	0	0	1
c	0	0	1	0	0
$\neg c$	0	0	1	1	0
C_1'	0	0	0	1	0
C_1''	0	0	0	1	0
C_2'	0	0	0	0	1
C_2''	0	0	0	0	1
S	1	1	1	3	3