

Hľadanie mín

kuko

17.2.2021

Pokročilá teória zložitosti

2	3		2	2		2	1
		4			4		2
	?					4	
	5		6				2
2				5	5		2
1	3	4				4	
	1		4				3
	1	2		2	3		2

2	3	1	2	2	1	2	1
1	1	4			4	1	2
	<i>a</i>					4	1
1	5		6	1	1		2
2	1	1		5	5		2
1	3	4		1	1	4	1
	1	1	4	<i>b</i>		1	3
	1	2	1	2	3	1	2

2	3	1	2	2	1	2	1
1	1	4		c	4	1	2
	a				X	4	1
1	5		6	1	1	✓	2
2	1	1	X	5	5	X	2
1	3	4	✓	1	1	4	1
	1	1	4	X	✓	1	3
	1	2	1	2	3	1	2

2	3	1	2	2	1	2	1
1	1	4	✓	✗	4	1	2
	<i>a</i>	✗	✗	✓	✗	4	1
1	5	✗	6	1	1	✓	2
2	1	1	✗	5	5	✗	2
1	3	4	✓	1	1	4	1
	1	1	4	✗	✓	1	3
	1	2	1	2	3	1	2

2	3	1	2	2	1	2	1
1	1	4	X	✓	4	1	2
	a	d	e	X	X	4	1
1	5	f	6	1	1	✓	2
2	1	1	X	5	5	X	2
1	3	4	✓	1	1	4	1
	1	1	4	X	✓	1	3
	1	2	1	2	3	1	2

2	3	1	2	2	1	2	1
1	1	4	✓	✗	4	1	2
	<i>a</i>	✗	✗	✗	✓	4	1
1	5	✗	6	1	1	✗	2
2	1	1	✓	5	5	✓	2
1	3	4	✗	1	1	4	1
	1	1	4	✓	✗	1	3
	1	2	1	2	3	1	2

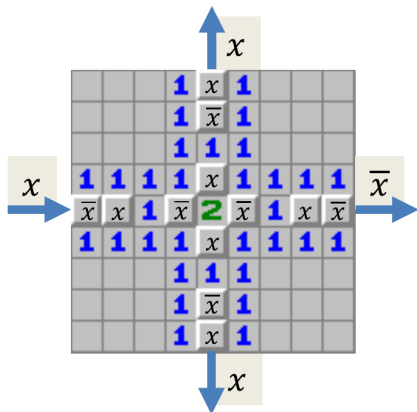
1	1	1	1
	1		
1	1	1	1

[illegible]



- $x = 1 \Rightarrow$ mína
- $x = 0 \Rightarrow$ voľné

			1	2	2	1		
1	1	1	2	1	1	3	1	
1	$\overline{x}$	x	1	$\overline{x}$	1	1	2	
1	1	1	1	2	x	1	2	
				1	1	2	1	
				1	$\overline{x}$	1		
				1	x	1		
				1	1	1		

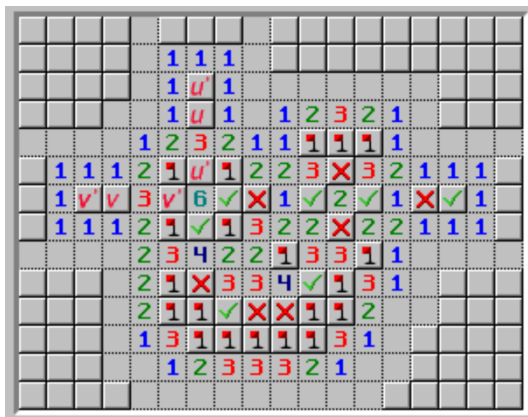


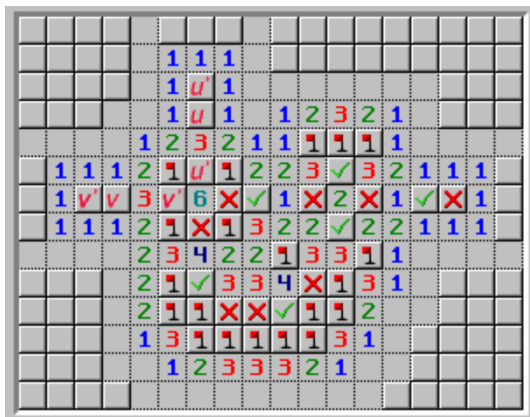
	1	2	2	1	
	2			2	1
	3		x	3	$\bar{x}$
	2			2	1
	1	2	2	1	

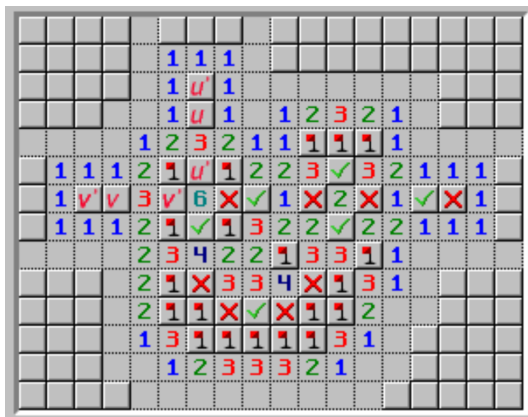


	1	2	3	2	1
	1	1	1	1	2
1	2	4	x	5	$\bar{x}$
x	2	$\bar{x}$	1	1	2
1	2	1	1	3	1
	1	2	2	1	1

				1	1	1													
				1	u'	1													
				1	u	1		1	2	3	2	1							
				1	2	3	2	1	1	1	1	1							
	1	1	1	2	1	u'	1	2	2	3	r'	3	2	1	1	1			
	1	v'	v	3	v'	6	r	r'	1	r	2	r	1	r'	r	1			
	1	1	1	2	1	s	1	3	2	2	r'	2	2	1	1	1			
				2	3	4	2	2	1	3	3	1	1						
				2	1	s'	3	3	4	r	1	3	1						
				2	1	1	a	b	c	1	1	2							
				1	3	1	1	1	1	1	3	1							
				1	2	3	3	3	2	1									







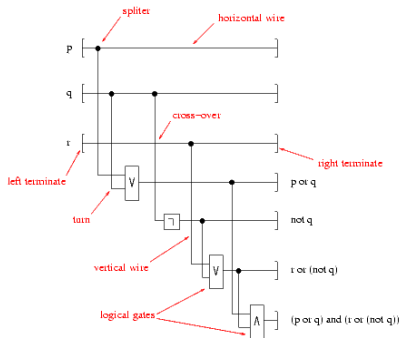
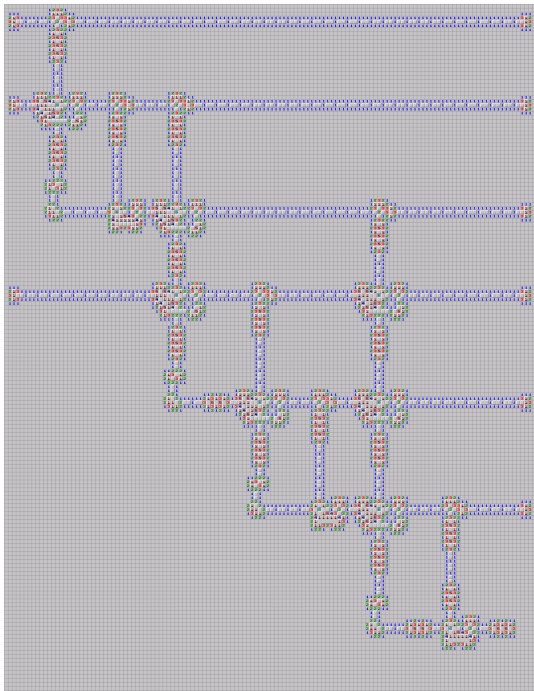


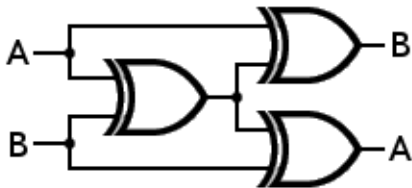
Figure 1 First step of translation

$$(p \vee q) \wedge (r \vee \neg q)$$

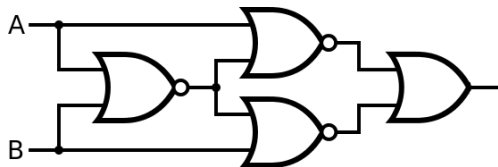


1	ν	1
1	1	1
2	$\overline{\nu}$	2
x	ν	$\overline{x}$
2	2	2
1	$\overline{\nu}$	1
1	ν	1
1	1	1
1	$\overline{\nu}$	1
1	ν	1
1	1	1
1	$\overline{\nu}$	1

- kríženie drátov



- výmena pomocou XOR



- XOR pomocí OR + NOT

Veta

Daná je rozohratá hra míny. Problém zistiť, či na danom políčku môže byť mína je NP-úplný.

■ **Dôkaz.** Redukcia SAT $\rightarrow$ MINESWEEPER.

