

### 1. 数独

a)

	1	2	3	4
a	1			3
b	4			2
c	2			1
d		1	2	

变量:  $X = \{X_{a1}, X_{a2}, \dots, X_{a4}, X_{b1}, \dots, X_{b4}, \dots, X_{c1}, \dots, X_{d4}\}$

值域:  $D = \{D_{a1}, D_{a2}, \dots, D_{a4}, D_{b1}, \dots, D_{b4}, \dots, D_{c1}, \dots, D_{d4}\}$

$X_{kj} \in D_{kj} = \{1, 2, 3, 4\}$   $k \in \{a, b, c, d\}$   $j \in \{1, 2, 3, 4\}$

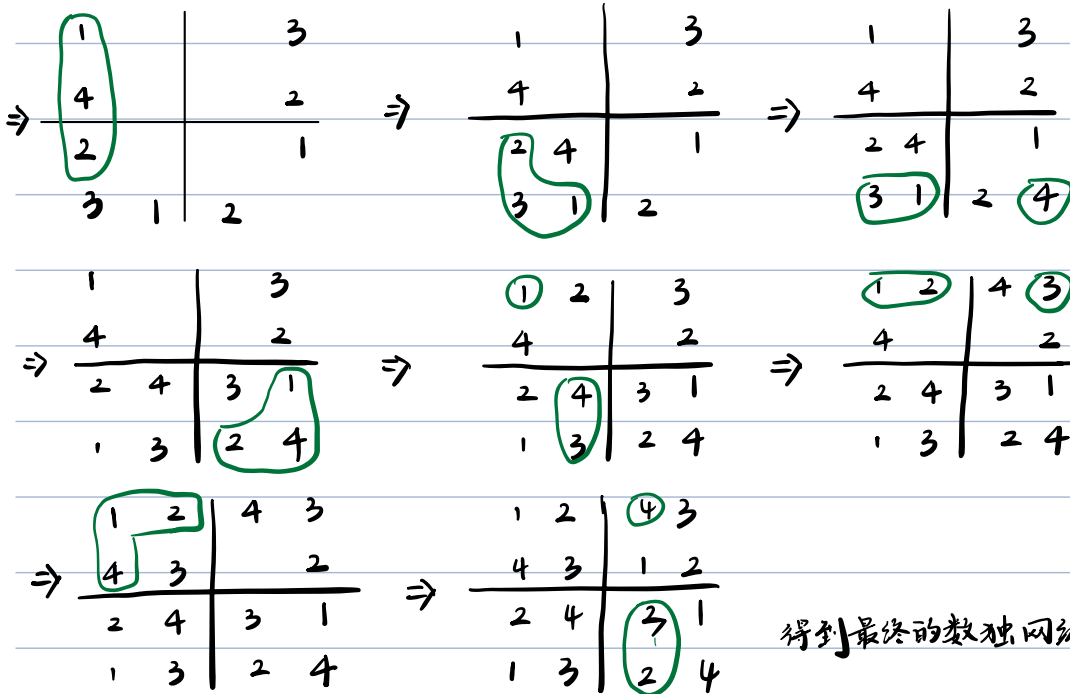
约束:  $C = (X_{a1}, X_{a2}, X_{a3}, X_{a4}), (X_{b1}, \dots, X_{b4}), (X_{c1}, \dots, X_{c4}), (X_{d1}, \dots, X_{d4})$

$(X_{a1}, \dots, X_{d1}), (X_{a2}, \dots, X_{d2}), (X_{a3}, \dots, X_{d3}), (X_{a4}, \dots, X_{d4})$

$(X_{a1}, X_{a2}, X_{b1}, X_{b2}), (X_{a3}, X_{a4}, X_{b3}, X_{b4}), (X_{c1}, X_{c2}, X_{d1}, X_{d2}), (X_{c3}, X_{c4}, X_{d3}, X_{d4}),$

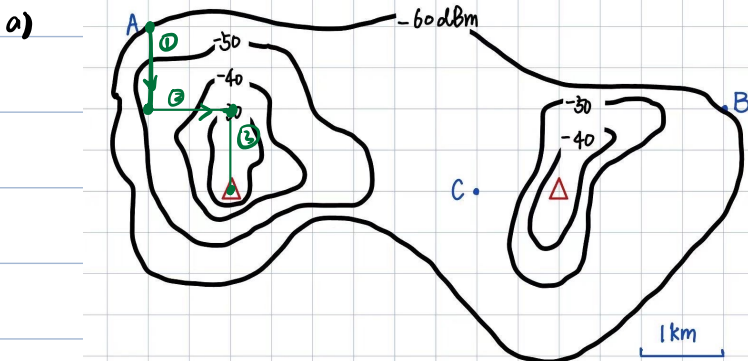
All diff)

b) 搜索过程中首先关注最少剩余值的变量 (约束满足搜索算法)



得到最终的数独网络。

### 3.



每一步飞行尽可能使得信号增强(不变)

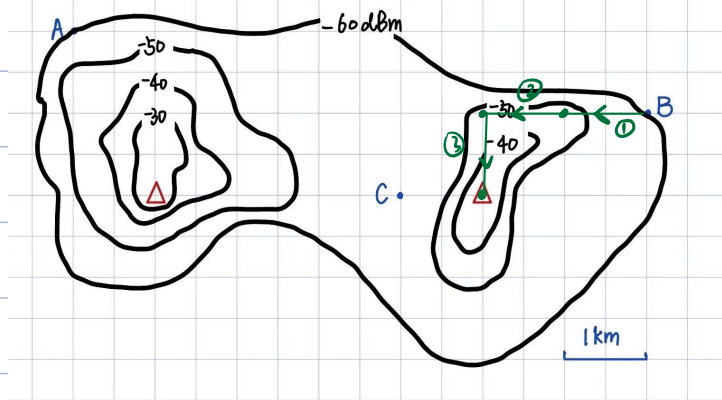
若四个方向均无法使信号增强(不变)

则随机选择一个方向。

如图所示,从A出发

可以抵达信号最强的区域

b)

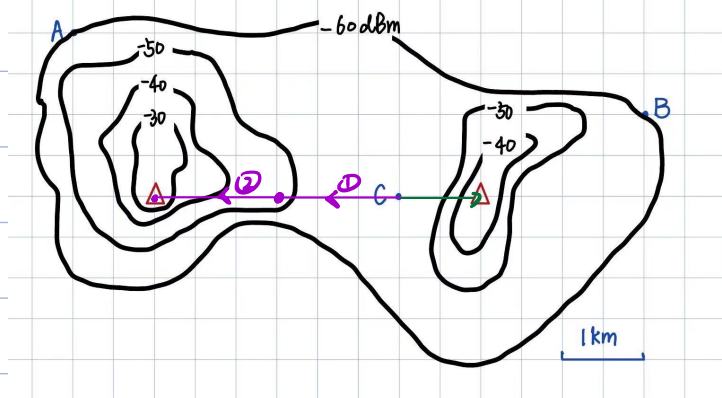


由B出发,会抵达次优信号塔

所在位置(局部最优解)

无法到达最强的区域

c)



当步长为1km时,

只有向左飞,信号增强,

此时恰好抵达次优信号塔所在,无法抵到最强区域

若步长为0.5k,可以抵达最强区域

d) 初始化位置,若初始化离最优解越近,抵达的概率大幅度增加,

否则容易陷入局部最优

移动步长,不同初始化点位最优的移动步长也不同,移动步长的合理

选择有时可以避免落入局部最优解。