

# Practice Assignment: SAT Example

## Hill Climbing

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### State Space

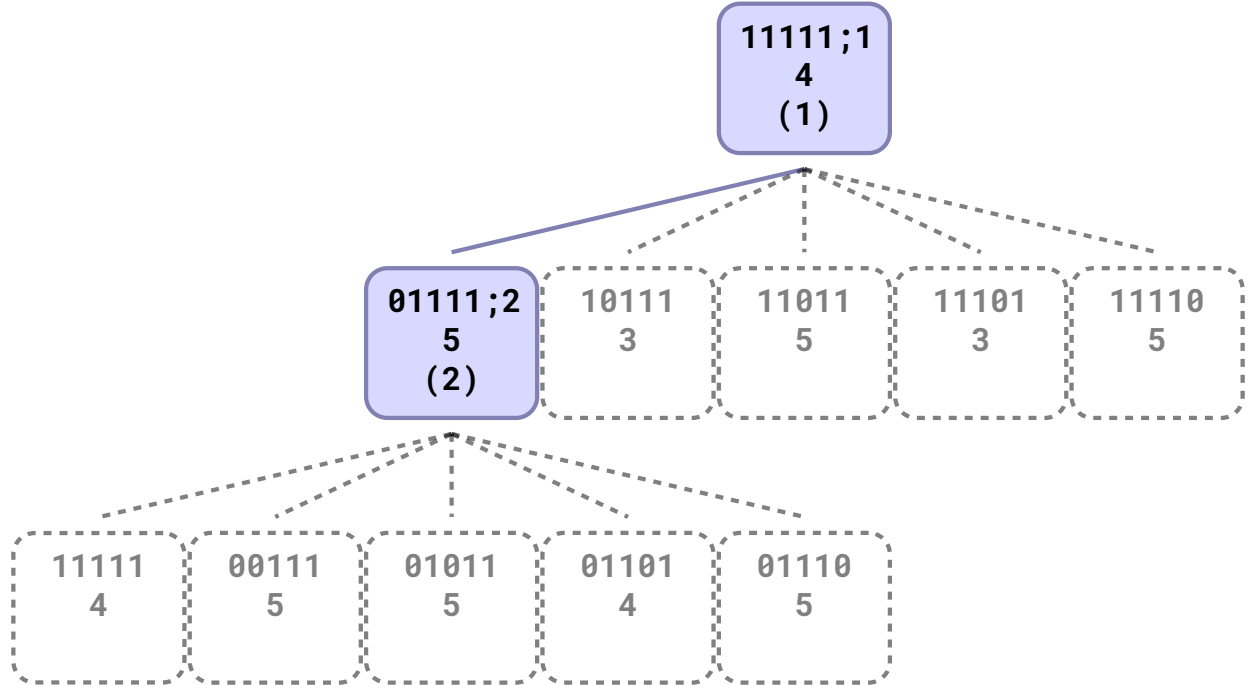
The start state is “11111”.

MoveGen is a one bit flip function.  
It flips the bits from left to right, one bit at a time, and accordingly returns the neighbours.

$$F(abcde) = (a \vee \neg b) \wedge (\neg a \vee \neg c) \wedge (\neg a \vee \neg e) \wedge (b \vee \neg e) \wedge (\neg c \vee d) \wedge (c \vee e)$$

S.No.	abcde	h(F)	eval(F)	eval					
				$(a \vee \neg b)$	$(\neg a \vee \neg c)$	$(\neg a \vee \neg e)$	$(b \vee \neg e)$	$(\neg c \vee d)$	$(c \vee e)$
1	00000	5	0	1	1	1	1	1	0
2	00001	5	0	1	1	1	0	1	1
3	00010	5	0	1	1	1	1	1	0
4	00011	5	0	1	1	1	0	1	1
5	00100	5	0	1	1	1	1	0	1
6	00101	4	0	1	1	1	0	0	1
7	00110	6	1	1	1	1	1	1	1
8	00111	5	0	1	1	1	0	1	1
9	01000	4	0	0	1	1	1	1	0
10	01001	5	0	0	1	1	1	1	1
11	01010	4	0	0	1	1	1	1	0
12	01011	5	0	0	1	1	1	1	1
13	01100	4	0	0	1	1	1	0	1
14	01101	4	0	0	1	1	1	0	1
15	01110	5	0	0	1	1	1	1	1
16	01111	5	0	0	1	1	1	1	1
17	10000	5	0	1	1	1	1	1	0
18	10001	4	0	1	1	0	0	1	1
19	10010	5	0	1	1	1	1	1	0
20	10011	4	0	1	1	0	0	1	1
21	10100	4	0	1	0	1	1	0	1
22	10101	2	0	1	0	0	0	0	1
23	10110	5	0	1	0	1	1	1	1
24	10111	3	0	1	0	0	0	1	1
25	11000	5	0	1	1	1	1	1	0
26	11001	5	0	1	1	0	1	1	1
27	11010	5	0	1	1	1	1	1	0
28	11011	5	0	1	1	0	1	1	1
29	11100	4	0	1	0	1	1	0	1
30	11101	3	0	1	0	0	1	0	1
31	11110	5	0	1	0	1	1	1	1
32	11111	4	0	1	0	0	1	1	1

# Search Tree



## Solution

Break ties by selecting the smallest bit-string in numerical order.

Tuple: (NODE,H-VALUE)

1.

NODE	11111
close	(11111,4)
moveGen	01111:10111:11011:11101:11110:[ ]
children	(01111,5):(10111,3):(11011,5):(11101,3):(11110,5):[ ]

2.

NODE	01111
close	(01111,5)
moveGen	11111:00111:01011:01101:01110:[ ]
children	(11111,4):(00111,5):(01011,5):(01101,4):(01110,5):[ ]

PATH	[ ]
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