Practice Assignment: SAT Example
Beam Search

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State Space

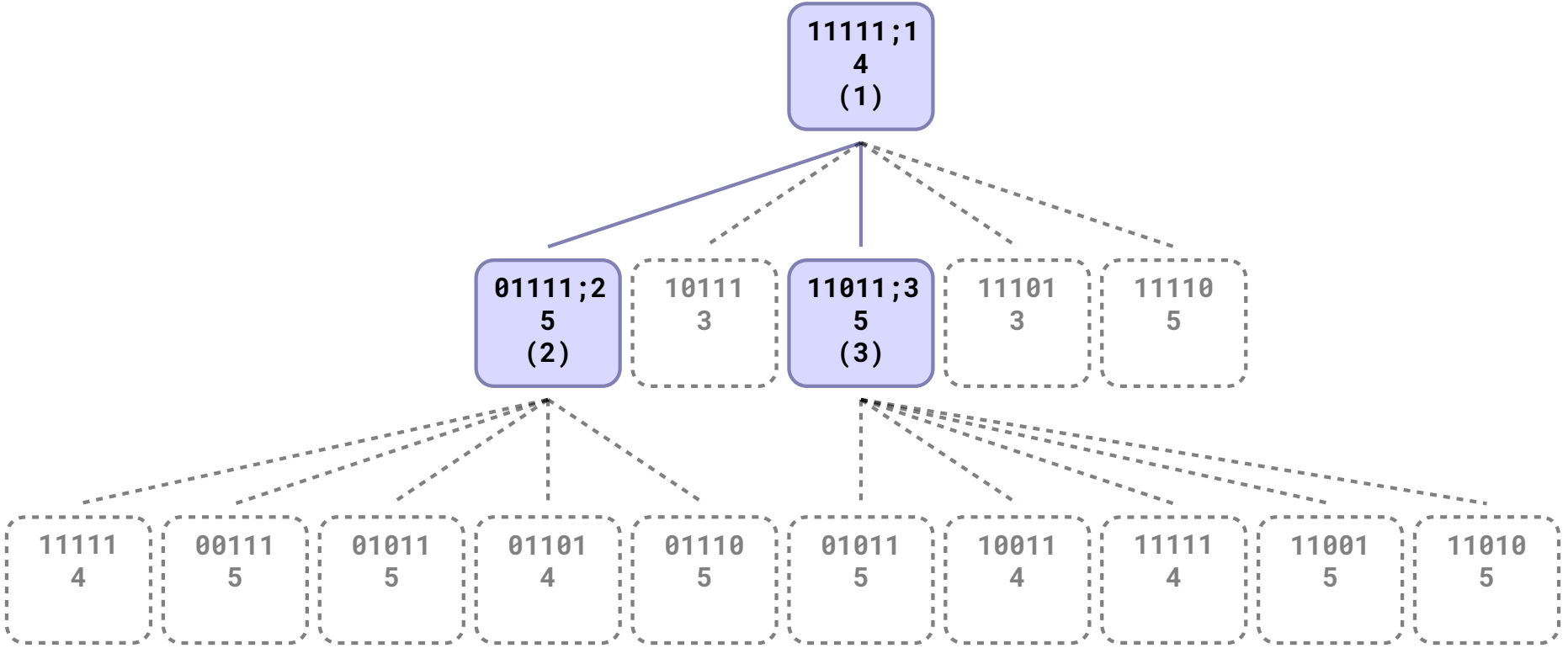
The start state is “11111”.

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.

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

				eval					
S.No.	abcde	h(F)	eval(F)	$(a \vee \neg b)$	$(\neg a \vee \neg c)$	$(\neg a \vee \neg e)$	$(b \vee \neg e)$	$(\neg c \vee d)$	$(c \vee e)$
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


11111;14
(1)
01111;25
(2)
10111
3
11011;35
(3)
11101
3
11110
5
11111
4
00111
5
01011
5
01101
4
01110
5
01011
5
10011
4
11111
4
11001
5
11010
5

Solution (w=2)

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

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Tuple: (NODE,H-VALUE)

1.
OPEN       (11111,4):[]
moveGen    01111:10111:11011:11101:11110:[]
neighbours (01111,5):(11011,5):(11110,5):(10111,3):(11101,3):[]

OPEN       (01111,5):(11011,5):[]

2.
OPEN       (01111,5):(11011,5):[]

moveGen    11111:00111:01011:01101:01110:[]
moveGen    01011:10011:11111:11001:11010:[]

neighbours (00111,5):(01011,5):(01011,5):(01110,5):(11001,5):
           (11010,5):(01101,4):(10011,4):(11111,4):(11111,4):[]

OPEN       []
```