8 Puzzle Problem
f= g + h

Definition 1.

g(n) = number of moves taken in going from S_I to S.
h_1(n) = number of tiles in S in the "wrong position"

S_I:

2	8	3
1	6	4
7		5

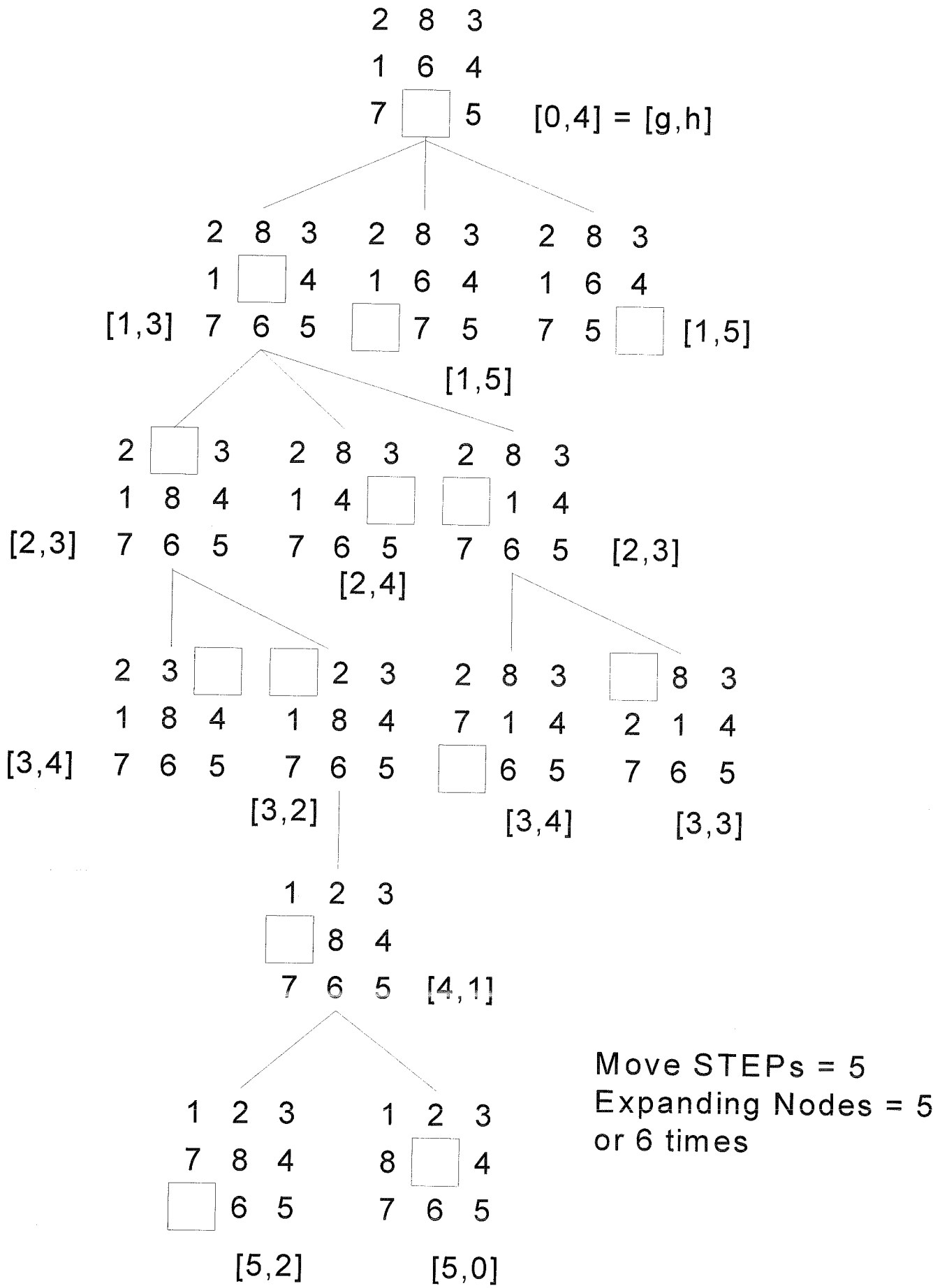
S_F:

1	2	3
8		4
7	6	5

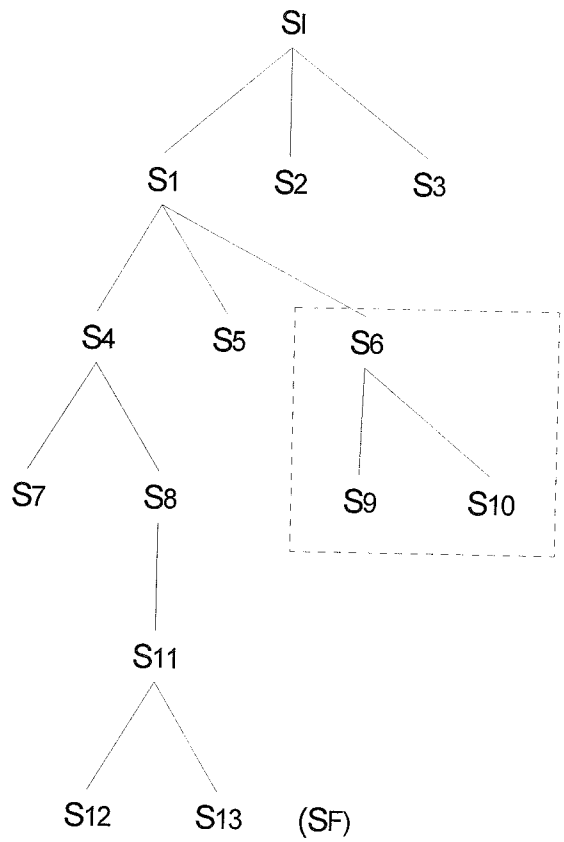
$$S_I \neq S_F$$

Question: Is h_1 admissible?

$$h_1 <= h^*$$



Move STEPs = 5
Expanding Nodes = 5
or 6 times



Queue:

SI

S1 f=4	S2 f=6	S3 f=6

S4 f=5	S6 f=5	S5 f=6	S2 f=6	S3 f=6

S8 f=5	S6 f=5	S5 f=6	S2 f=6	S3 f=6	S7 f=7

S11 f=5	S6 f=5	S5 f=6	S2 f=6	S3 f=6	S7 f=7

S13 f=5	S6 f=5	S5 f=6	S2 f=6	S3 f=6	S7 f=7	S12 f=7

SF

or

S6 f=5	S4 f=5	S5 f=6	S2 f=6	S3 f=6

S4 f=5	S5 f=6	S2 f=6	S3 f=6	S10 f=6	S9 f=7

S8 f=5	S5 f=6	S2 f=6	S3 f=6	S10 f=6	S9 f=7	S7 f=7

S11 f=5	S5 f=6	S2 f=6	S3 f=6	S10 f=6	S9 f=7	S7 f=7

S13 f=5	S5 f=6	S2 f=6	S3 f=6	S10 f=6	S9 f=7	S7 f=7	S12 f=7

SF

Definition 2.

$$f = g + h_2$$

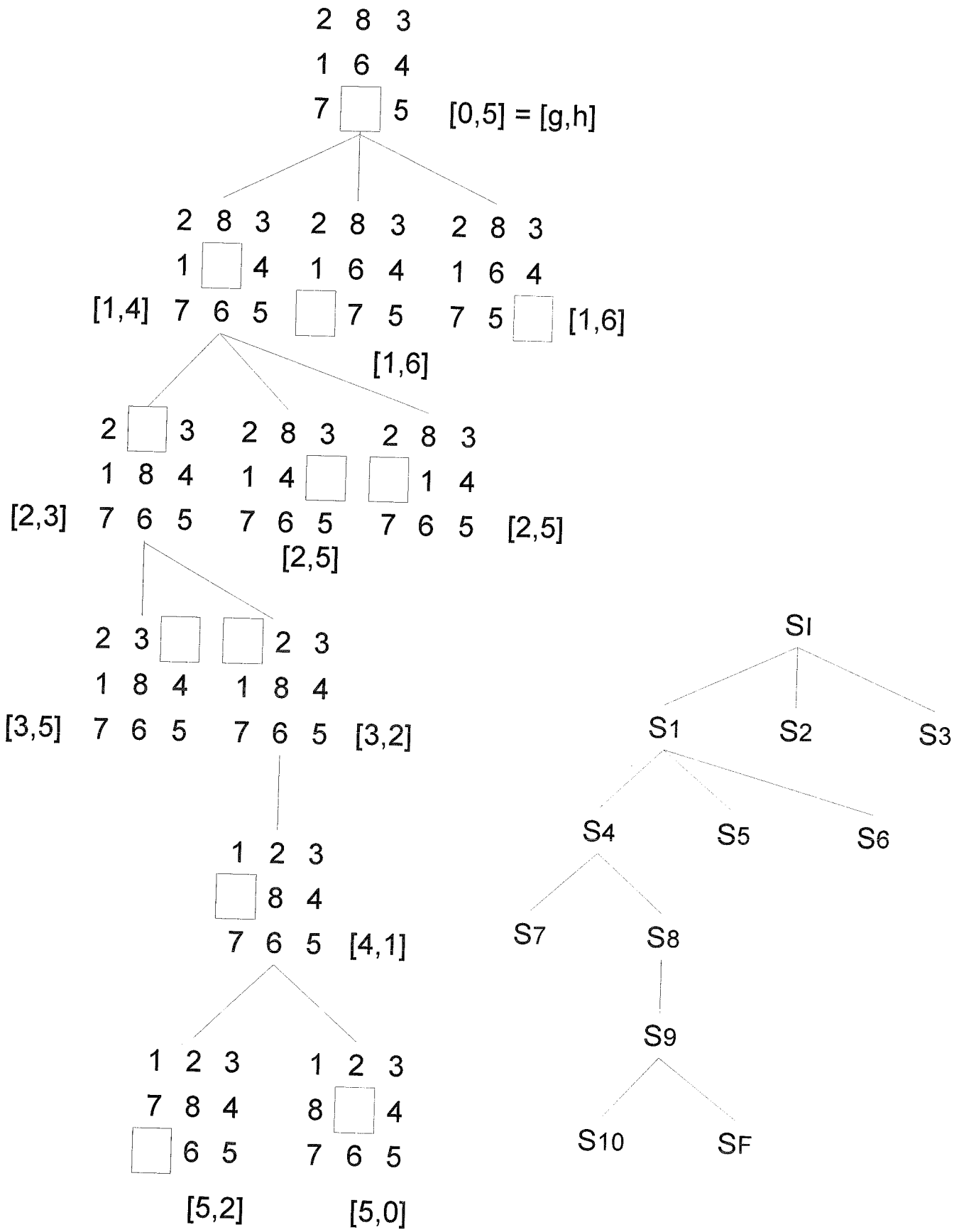
g(n) = number of moves taken in going from S_I to S. (node n)
h_2(n) = sum of the distances of the tiles from S_F position.

S_I:				S_F:			
	2	8	3		1	2	3
	1	6	4		8		4
	7		5		7	6	5

$$S_I \Rightarrow S_F$$

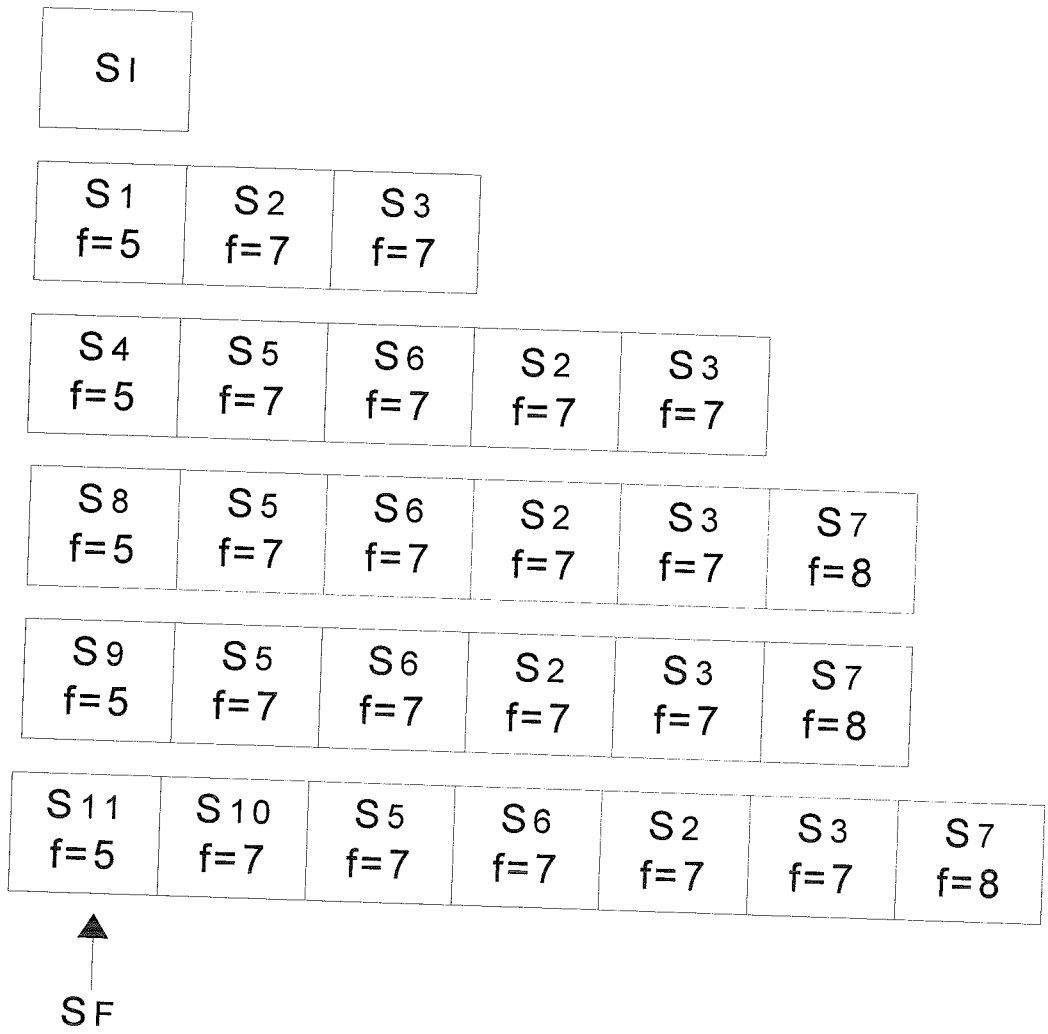
Question: Is h_2 admissible?

$$h_1 <= h_2 <= h^*$$



Move STEPs = 5
Expanding Nodes = 5 times

Queue:


SI
S1 f=5
S2 f=7
S3 f=7
S4 f=5
S5 f=7
S6 f=7
S2 f=7
S3 f=7
S8 f=5
S5 f=7
S6 f=7
S2 f=7
S3 f=7
S7 f=8
S9 f=5
S5 f=7
S6 f=7
S2 f=7
S3 f=7
S7 f=8
S11 f=5
S10 f=7
S5 f=7
S6 f=7
S2 f=7
S3 f=7
S7 f=8
SF