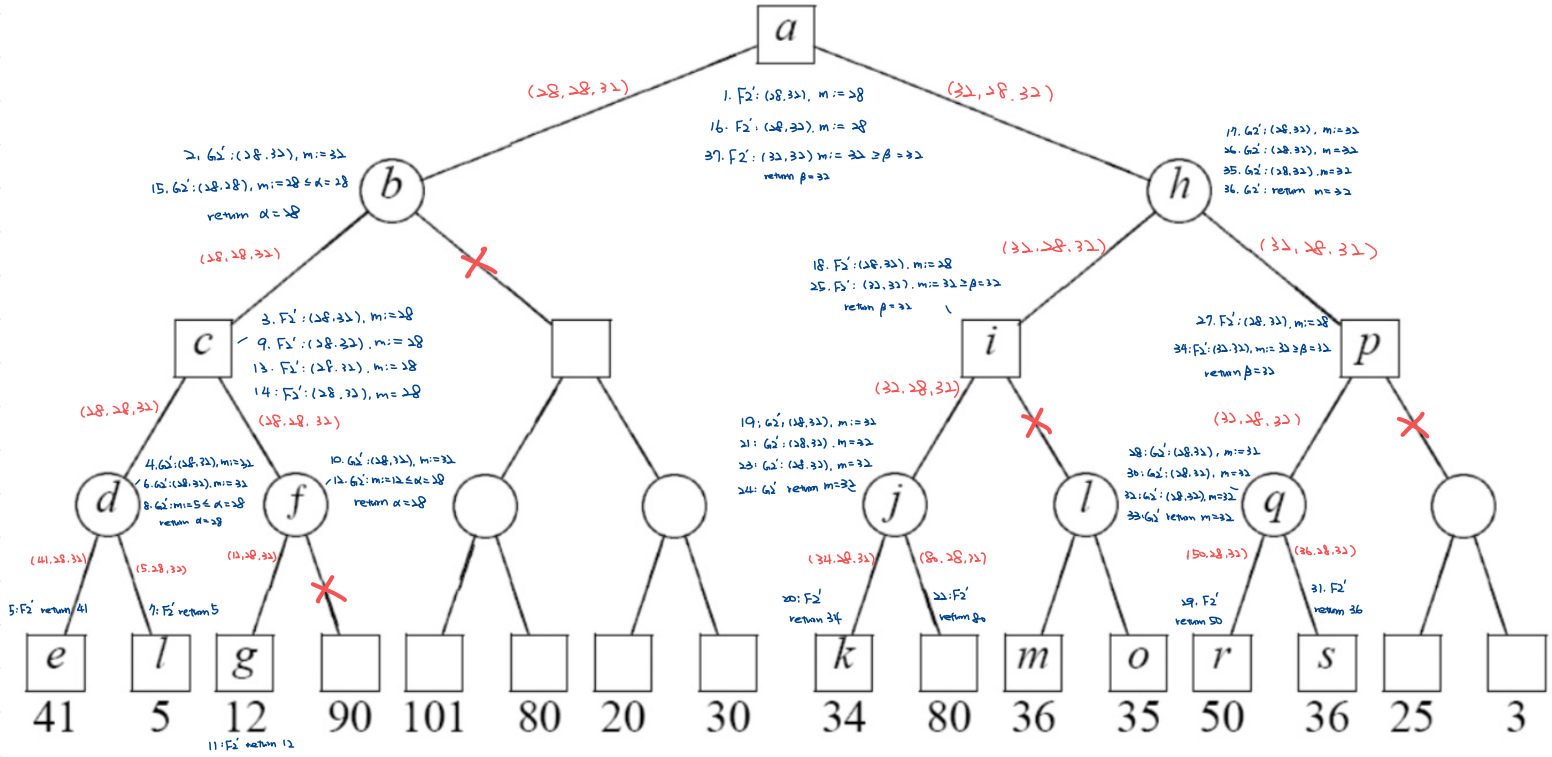
Theory of Computer Games

Homework #4

3116050004
劉子齊

1. (a)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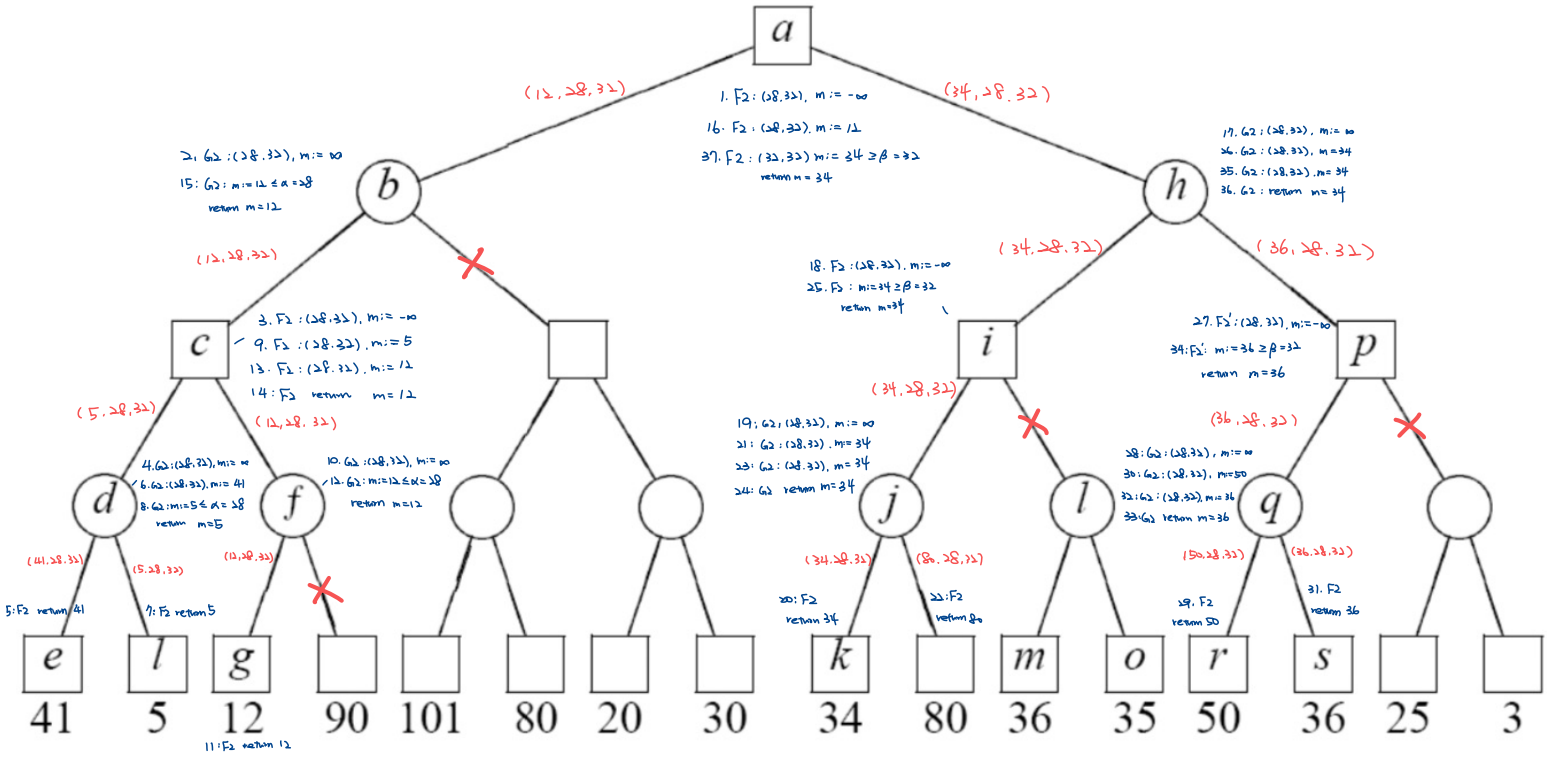
(b)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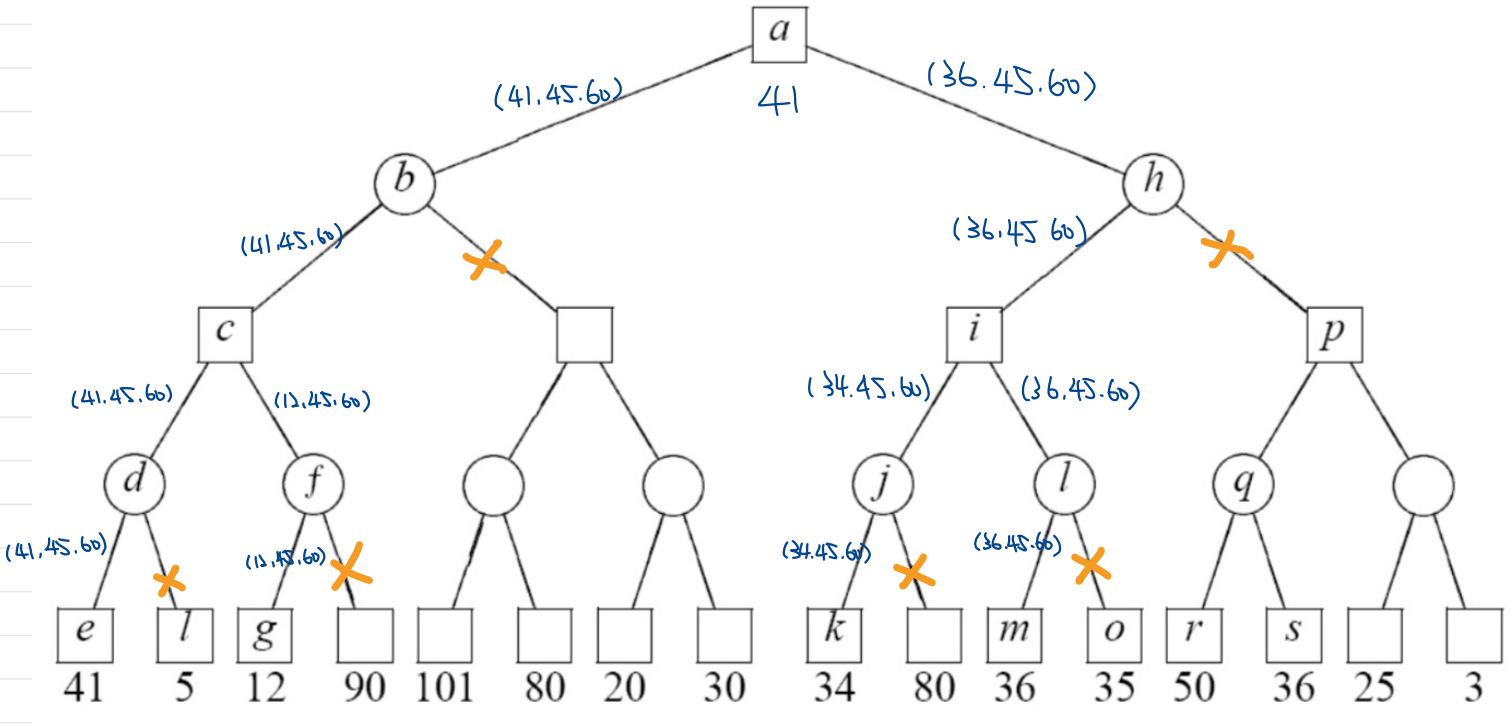
2.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(36.45.60)
b
h
(41.45.60)
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c
i
p
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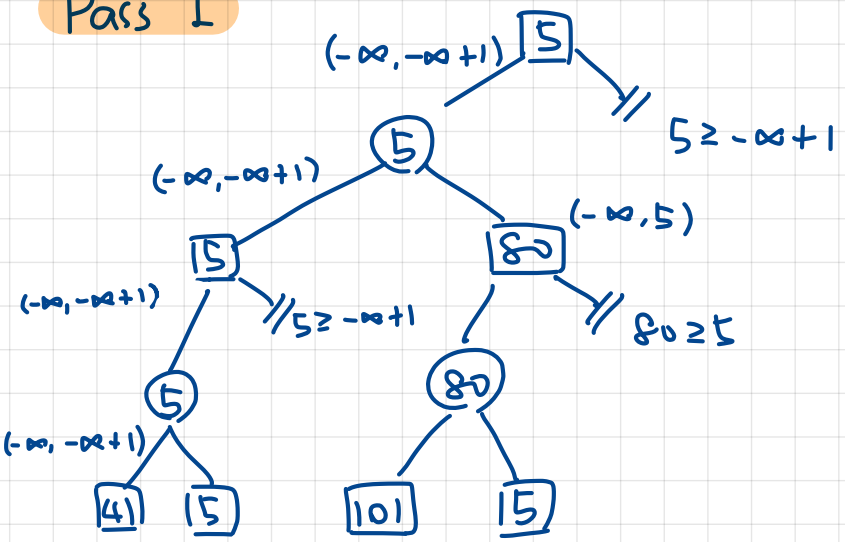
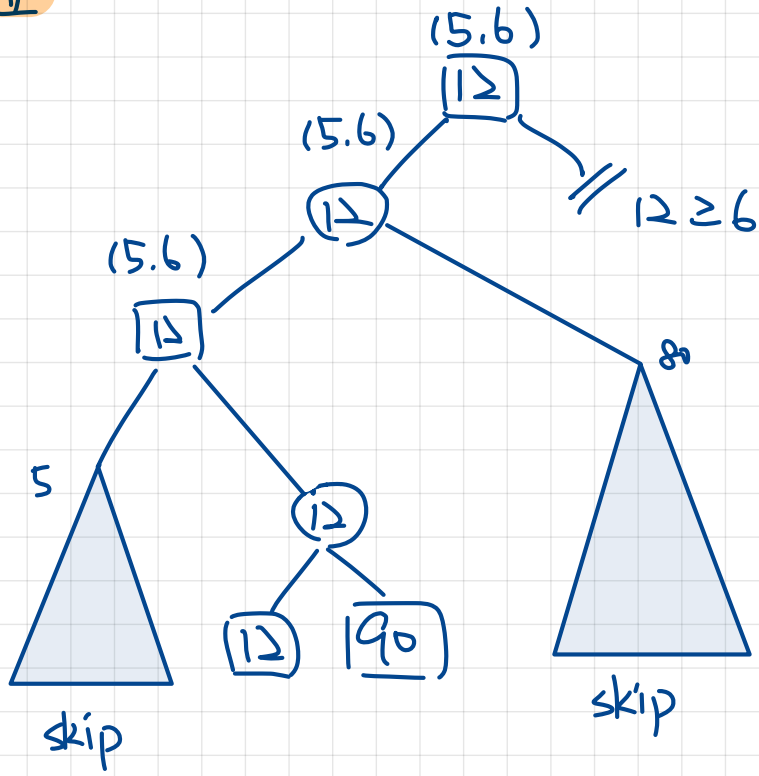
3.

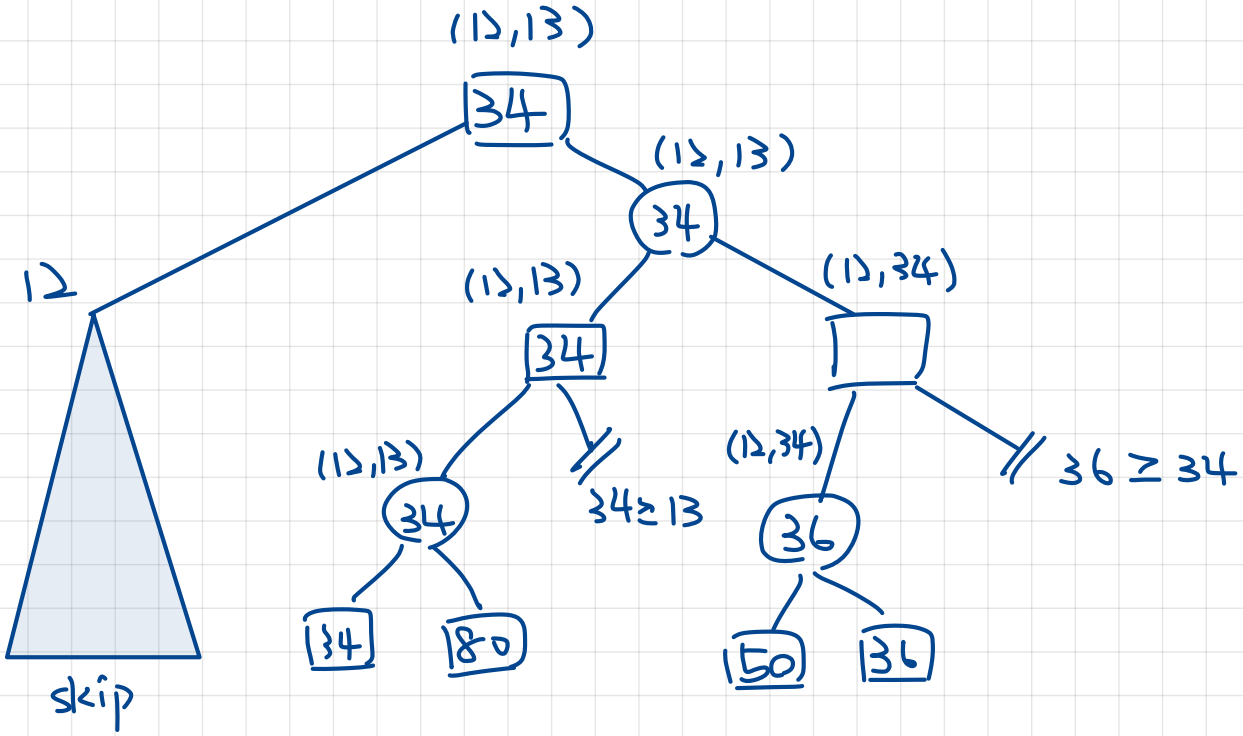
Pass I


(-∞,-∞+1)
5
5≥-∞+1
5
(-∞,-∞+1)
(-∞,5)
15
80
(-∞,-∞+1)
5≥-∞+1
80≥5
5
80
(-∞,-∞+1)
41
15
101
15

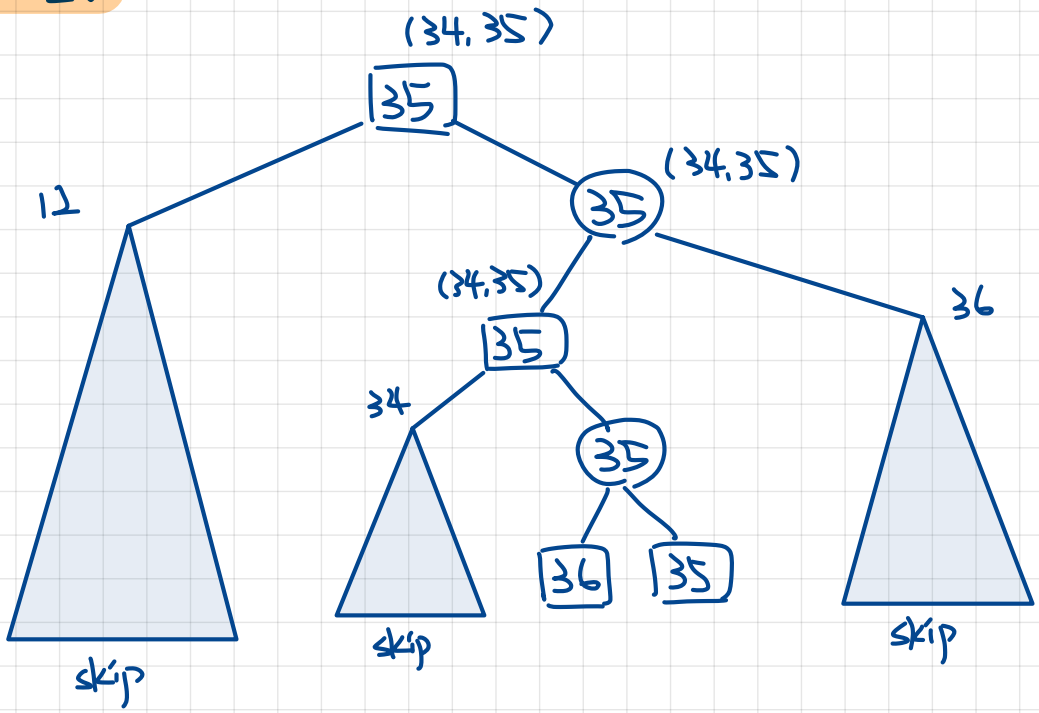
Pass II



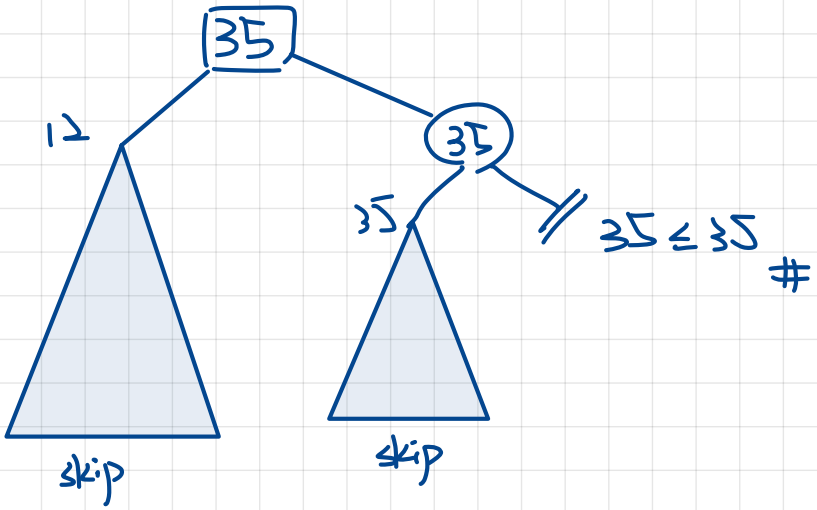
Pass III



Pass IV



Pass V



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(a)

We will have to design a Z-hashing function for any given position. Also we need to create a fixed array A with $2 \times 15 \times 15 = 450$ randomly generated integers.

To calculate the hash value of a board, for each stone on a board, we find its corresponding random integer A, then we perform the XOR calculation to it.

ex. A[0][0][0] ⊕ A[0][0][2] ⊕ A[1][1][1]

(b)

For this task, we have to define a new Z-hashing function for 3 consecutive positions like (P_i, P_{i+1}, P_{i+2}).

We can generate 3 fixed random integers, ex. X_0, X_1, X_2, as the 3 positions. Then we can define the hashing function for a path as:

$$hash_{path}(P_i, P_{i+1}, P_{i+2}) = (X_0 \times hash(P_i)) \oplus (X_1 \times hash(P_{i+1})) \oplus (X_2 \times hash(P_{i+2}))$$

※ hash( ) is the hashing function we defined above.