

1. Atcoder Task B : Frog 2

TASK - B : Frog 2 = https://atcoder.jp/contests/dp/tasks/dp_b

For this case, here we can jump at most k stone, so time complexity will be $O(n * k)$ which was before only $O(n)$.

2. Atcoder Task B : Frog 2 in Code.

Solving Frog2 with Memoization + Tabulation in both method.

3. Solving DP with 2 dimensions : 2Dimension DP.

TASK - C : Vacation : https://atcoder.jp/contests/dp/tasks/dp_c

nth day (x, y, d) happiness :

$$\text{fun}(n, x) = \max \{ \text{fun}(n-1, \text{without } x) + \text{happiness}(n, x) \}$$

If we can't solve a dp problem with only one state, we will try to solve that problem with more than one state.

Leap of Faith = Backtracking

Time Complexity : $O(n * x)$ if, $\text{fun}(a, b, c, d)$ then $\rightarrow O(a * b * c * d)$

If $\text{fun}(a, b, c, d)$:

for (k - length) :

for(k - length)

Then $\rightarrow O(a * b * c * d * k^2)$

For this problem,

Time Complexity : $O(n * x^3) \rightarrow O(9n) \rightarrow O(n)$

Space Complexity : $\text{dp}[n][x] : O(n * x) \rightarrow O(3n) \rightarrow O(n)$

4. CODE : Implementation in Code in Both Memoization + Tabulation Method

TASK - C : Vacation : https://atcoder.jp/contests/dp/tasks/dp_c