**Cut Logs**

#include<bits/stdc++.h>

int calculateMinCuts(int e, int f, vector<vector<int>>& dp) {

if (f <= 1 || e == 1) {

return dp[e][f] = f;

}

if (dp[e][f] != -1) {

return dp[e][f];

}

int ans = 1e6, start = 1, end = f;

while (start <= end) {

int mid = start + (end - start) / 2;

if (dp[e - 1][mid - 1] == -1) {

dp[e - 1][mid - 1] = calculateMinCuts(e - 1, mid - 1, dp);

}

int BREAK = dp[e - 1][mid - 1];

if (dp[e][f - mid] == -1) {

dp[e][f - mid] = calculateMinCuts(e, f - mid, dp);

}

int SURVIVE = dp[e][f - mid];

ans = min(ans, 1 + max(BREAK, SURVIVE));

if (BREAK < SURVIVE) {

start = mid + 1;

}

else {

end = mid - 1;

}

}

return dp[e][f] = ans;

}

int cutLogs(int k, int n) {

vector<vector<int>> dp(k + 1, vector<int>(n + 1, -1));

return calculateMinCuts(k, n, dp);

}