**Question :**

Let’s create a variation in the problem , instead of 1 0r 2 steps.Now you can make 1 or 2 or 3 steps

Then the recurrence relation as follows,

Recurrence Relation :

If index “i” is even ,

* Dp[i][even] = dp[i - 1][even] + dp[i- 2] [even] + dp[i - 3][even]
* Dp[i][odd] = dp[i - 1][odd] + dp[i - 2][odd] + dp[i -3] [odd]

If index “i” is odd ,

* Dp[i][even] = dp[i - 1][odd] + dp[i - 2][odd] + dp[i -3] [odd]
* Dp[i][odd] = dp[i - 1][even] + dp[i- 2] [even] + dp[i - 3][even]

**Code :**

class Solution {

public int[] numberOfJourney(int [] nums , int n) {

int [][] dp = new int[n][2];

//Let's consider 0 for even and 1 for odd.

if(nums[0] % 2 == 0){

dp[0][0] = 1

}else{

dp[0][1] = 1;

}

//We need to be careful when calculating for index 1

//if the value at index 1 is even , then

if(nums[1] % 2 == 0){

//if the previous value is also even , then we can put 1

if(dp[0][0] == 1)

dp[1][0] = 1;

//If the previous value is odd , then it will be odd (odd + even) = odd

else

dp[1][1] = 1;

}

//if the number at current index is odd

else{

//if the previous index element is odd , then it will be even (odd + odd) = even

if(dp[0][1] == 1)

dp[1][0] = 1;

//If the previous index is even , then it will be odd (even + odd) = odd

else

dp[1][1] = 1;

}

if(nums[2] % 2 == 0){

dp[2][0] = dp[0][0] + dp[1][0];

dp[2][1] = dp[0][1] + dp[1][1];

}else {

dp[2][0] = dp[0][1] + dp[1][1];

dp[2][1] = dp[0][0] + dp[1][0];

}

for(int i = 3 ; i < n ; i++){

// we use "0" for even and "1" for odd

if(nums[i] % 2 == 0){

// dp[i][even] =dp[i - 1][even] + dp[i- 2] [even] + dp[i - 3][even]

// dp[i][odd] = dp[i - 1][odd] + dp[i - 2][odd] + dp[i -3] [odd]

dp[i][0] = dp[i - 1][0] + dp[i - 2][0] + dp[i - 3][0];

dp[i][1] = dp[i - 1][1] + dp[i - 2][1] + dp[i - 3][1];

}else{

// dp[i] [even] = dp[i - 1][odd] + dp[i - 2][odd] + dp[i -3] [odd]

// dp[i] [odd] = dp[i - 1][even] + dp[i- 2] [even] + dp[i - 3][even]

dp[i][0] = dp[i - 1][1] + dp[i - 2][1] + dp[i - 3][1];

dp[i][1] = dp[i - 1][0] + dp[i - 2][0] + dp[i - 3][0];

}

}

}

}