1-DP-Playing with Numbers

Aim:

**Playing with Numbers:**

Ram and Sita are playing with numbers by giving puzzles to each other. Now it was Ram term, so he gave Sita a positive integer ‘n’ and two numbers 1 and 3. He asked her to find the possible ways by which the number n can be represented using 1 and 3.Write any efficient algorithm to find the possible ways.

**Example 1:**

***Input:****6****Output:****6****Explanation:****There are 6 ways to 6 represent number with 1 and 3  
         1+1+1+1+1+1  
         3+3  
         1+1+1+3  
         1+1+3+1  
         1+3+1+1  
         3+1+1+1*  
**Input Format**  
First Line contains the number n  
   
**Output Format**

**Print: The number of possible ways ‘n’ can be represented using 1 and 3**

Sample Input  
   
6

Sample Output

6

Algorithm:

1. Read an integer n from the user.

2. Declare an array a of size n+1 to store intermediate results.

3. Initialize a[0] = 1 as the base case.

4. Set all other elements of a to 0 using a loop.

5. For each i from 1 to n, update a[i] by adding a[i-1] and a[i-3] (if i >= 3).

6.Print the value of a[n] as the result.

7.End the program.

Code:

#include <stdio.h>

int main()

{

int n;

scanf("%d",&n);

long long a[n+1];

a[0]=1;

for(int i=1;i<=n;i++)

{

a[i]=0;

}

for(int i=1;i<=n;i++)

{

a[i]+=a[i-1];

if(i>=3)

{

a[i]+=a[i-3];

}

}

printf("%lld",a[n]);

}

Output:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 6 | 6 | 6 |  |
|  | 25 | 8641 | 8641 |  |
|  | 100 | 24382819596721629 | 24382819596721629 |  |

Passed all tests!

**Correct**

Marks for this submission: 10.00/10.00.

Result:

The expected output was obtained