

```

1 //*****
2 //*****string Author = "SACHIN SAINI " *****
3 //*****
4
5 #include<bits/stdc++.h>
6 using namespace std;
7 long long find_fibonacci(long long);//function to find nth Fibonacci number
8 void calculatePowerofFn(long long [2][2],long long);//function to calculate power
9 void multiply(long long [2][2],long long[2][2]);//multiply function to multiply to matrices
10 #define mod 1000000007 //define mod with 1000000007 so we can use mod in place of 1000000007
11 int main()
12 {
13     int t;
14     cin>>t; //test case
15     while(t-->0)
16     {
17         long long n;
18         cin>>n; //nth number is to be find
19         cout<<find_fibonacci(n)<<endl;
20     }
21     return 0;
22 }
23 long long find_fibonacci(long long n)
24 {
25     //We are using matrix {{1,1},{1,0}} to calculate the fibonacci number
26     //We will calculate F[n] using {{1,1},{1,0}}^n then after doing power answer will be F[0][0];
27     long long F[2][2]={{1,1},{1,0}}; //fibonacci array of which we will calculate power
28     if(n==0||n==1) //Base case
29     {
30         return 0LL; // ending with 'LL' makes it long long
31     }
32     else
33     {
34         calculatePowerofFn(F,n-1); //calling function calculate Power
35     }
36     return F[0][0]%mod; //returning the answer because answer is on the [0][0]th index
37 }
38 void calculatePowerofFn(long long F[2][2],long long n)
39 {
40     if( n == 0 || n == 1)
41         return;
42     long long M[2][2] = {{1,1},{1,0}};
43
44     calculatePowerofFn(F, n/2); //call recursively to find power fast
45     multiply(F, F);
46
47     if (n%2 != 0)
48         multiply(F, M);
49 }
50 void multiply(long long F[2][2],long long M[2][2])
51 {
52     //x,y,z,w are storing the value of matrix [0][0],[0][1],[1][0],[1][1] respectively;
53     long long x=((F[0][0]*M[0][0])%mod+(F[0][1]*M[1][0])%mod)%mod;
54     long long y=((F[0][0]*M[0][1])%mod+(F[0][1]*M[1][1])%mod)%mod;
55     long long z=((F[1][0]*M[0][0])%mod+(F[1][1]*M[1][0])%mod)%mod;
56     long long w=((F[1][0]*M[0][1])%mod+(F[1][1]*M[1][1])%mod)%mod;
57     F[0][0]=x;
58     F[0][1]=y;
59     F[1][0]=z;
60     F[1][1]=w;
61 }
62

```