

1375 - LCM Extreme

Find the result of the following code:

```
unsigned long long allPairLcm( int n ) {  
    unsigned long long res = 0;  
    for( int i = 1; i <= n; i++ )  
        for( int j = i + 1; j <= n; j++ )  
            res += lcm(i, j); // lcm means least common multiple  
    return res;  
}
```

A straight forward implementation of the code may time out.

Input

Input starts with an integer **T** ($\leq 2 \cdot 10^5$), denoting the number of test cases.

Each case starts with a line containing an integer **n** ($1 \leq n \leq 3 \cdot 10^6$).

Output

For each case, print the value returned by the function '**allPairLcm(n)**'. As the result can be large, we want the result modulo 2^{64} .

Sample Input	Output for Sample Input
4	Case 1: 2
2	Case 2: 1036
10	Case 3: 3111
13	Case 4: 9134672774499923824
100000	

Note

Dataset is huge, use faster I/O Methods.