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 ($\leq 2*10^5$)**, denoting the number of test cases.

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

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 2 10 13 100000	Case 1: 2 Case 2: 1036 Case 3: 3111 Case 4: 9134672774499923824

Note

Dataset is huge, use faster I/O Methods.