

# Tour to the Good Place



After her death, Miss Eleanor Shellstrop is welcomed to her afterlife in a community called "The Good Place". The community comprises of a group of  $N$  neighbourhoods ( $1$  to  $10^3$ ), labeled  $1, 2, 3, \dots, N$  and widely distributed.

The travel guide Michael has the power to take travelers from neighbourhood  $i$  to neighbourhood  $2i$  ( $1 \leq i \leq N/2$ ), visiting all intermediate neighborhoods. This costs 4 dollars. On the other hand, the guide Shawn has the power to take travelers from neighbourhood  $i$  to neighbourhood  $i+1$  for just 2 dollars.

Miss. Eleanor wants to visit neighbourhoods  $1, 2, 3, \dots, M$  ( $1 \leq M \leq N$ ). Eleanor can use Michael or Shawn to go from one neighbourhood to another. Write a program to help Miss Eleanor visit the  $M$  neighbourhoods at the lowest cost.

## Input Format

1st line contain number of test cases  $T$  and the next  $T$  lines contains  $M$  for each of the  $T$  test cases

## Constraints

$1 \leq M \leq N$

## Output Format

Return the minimum cost in dollars for visit  $M$  contiguous neighbourhoods

## Sample Input 0

```
2
8
14
```

## Sample Output 0

```
12
16
```

## Explanation 0

8 :  $0 \rightarrow 1$  (S);  $1 \rightarrow 2$  (S) ;  $2 \rightarrow 4$  (M) ;  $4 \rightarrow 8$  (M) . Total cost is  $2+2+4+4 = 12$

14:  $0 \rightarrow 1$ (S);  $1 \rightarrow 2$  (S) ;  $2 \rightarrow 3$  (S) ;  $3 \rightarrow 6$  (M) ;  $6 \rightarrow 7$  (S) ;  $7 \rightarrow 14$  (M) . Total cost is  $2+2+2+4+2+4 = 16$

Here S is for Shawn and M for Michael

For testcase#1:  $M = 8$ , cost to reach neighbourhood 1 is 2( $0 \rightarrow 1$ ). From neighborhood 1, we can go to neighborhood 2 ( $1 \rightarrow 2$ ) in 2 ways: with Shawn for 2 dollars and with Michael for 4 dollars, as 2 dollars is minimum, we choose Shawn. From neighborhood 2 we can visit all nodes from 2 to 4 with Michael for 4 dollars or with Shawn for 4( $2+2$ ) dollars. Similarly at 4, we can visit all nodes from 4 to 8 in 4 dollars with Michael or 8( $2+2+2+2$ ) dollars with Shawn, we choose Michael and so on.