A. Mango Bites

1 second, 256 megabytes

It's your birthday and you want to distribute Mongo Bites to your friends in an interesting way. You have N friends F_0, F_1 ... F_{N-1}. Suppose you give M_i Mango Bites to your i^{th} friend, F_i. You don't like your zeroth friend (F_0) so you give 0 Mango Bites to her, but you give 1 Mango Bite to your first friend (F_1).

For others, to the F_i friend, you give $M_{i/2} + 2 * M_{(2*i)/3} + 3 * M_{(3*i)/4}$ Mango Bites where [x/y] represents integer division, i.e., the quotient when you divide x by y.

Given N, find the number of Mango Bites you give to F_N.

Input
You are given one integer N.

$1 \leq N \leq 10^3$

Output
Print M_N, the number of Mango Bites you give to your N^{th} friend.

input
2
output
6

input
69
output
46424456

For the first test case, $N = 2$, $M_2 = M_1 + 2 * M_1 + 3 * M_1 = 6$

B. rdrdrdr

1 second, 256 megabytes

Your friend is at the entry point of a maze and needs to get out of it. The maze is a rectangular matrix with size $n * m$, the entry point of the maze is at $(1, 1)$ and the exit point is at (n, m). Every cell of the maze has a cost (C_{ij}) attached to it He need to pay C_{ij} amount as a fees if he go through this cell. He can only move towards right and towards down inside the maze. Additionally, he cannot move in the same direction more than twice, i.e., he cannot have a path : $R- > R- > R$ or $D- > D- > D$ Some examples of valid paths: $R- > R- > D$, $R- > D- > R$, $D- > R- > R$. (Here R denotes a movement towards right and D denotes a movement towards down). Now, your friend has asked you to find the **minimum amount** of money he would have to spend if he needs to get out of the matrix. In case your friend can't get out of the matrix, print -1.

Input
The first line contains two integers n and m ($1 \leq n, m < 20$).

The next n lines contain the maze ($n * m$) as space separated integers Cij ($1 \leq Cij < 10^9$) (Look at the sample test case for reference).

Output
You have to print a single integer: Minimum cost to reach the end of the matrix.

input
2 3 2 3 4 5 2 1
output
8

input
2 6 1 2 3 4 5 6 6 5 4 3 2 1
output
-1

Explanation of test case 1:

C. Akshat and Nakul play a game

3 seconds, 256 megabytes

Bored out of their wits after their End-semester exams, Akshat and Nakul decide to play a game and wager a treat in the canteen for the winner. They decide to take an array $arr[]$ of size n and take turns with Akshat going first.

At each turn, Akshat or Nakul take one of the elements from either end of the array and adds the selected element to their total score. This reduces the size of the array by 1. When the size of the array is 0, the game ends as no further choices are possible.

Return true if Akshat can win the game and eat his favorite veg rolls. In the case where the scores of both of them are equal, then Akshat is considered as the winner. You may assume that both Akshat and Nakul are smart enough to play optimally.

Note: Both Akshat and Nakul start with a score of 0.

Input
First line will contain the number of test cases, t

Next $2t$ lines corresponding to each test case will contain

First line will contain the size of the array, n

Next line will contain n integers which are elements of $arr[]$

$1 \leq t \leq 50$

$1 \leq n \leq 35$

$-10^8 \leq arr[i] \leq 10^8$

Output
Print a single string "true" or "false" depending on your answer.

input
2 5 1 2 3 4 5 3 1 2 3
output
true true

input
2 3 1 17 2 4 1 2 100 7

output
false true

Explanation of Example 2

At $t == 1$

Array is {1, 17, 2}, Akshat picks first, he can chose 1 or 2. If he chooses either of them, Nakul can choose 17 and will win the game. It is impossible for Akshat to win. Hence, output is false.

At $t == 2$

Array is {1, 2, 100, 7}, Akshat picks first, he can choose either 1 or 7. If he chooses 7, he loses by default because then Nakul will choose 100. So Akshat will choose 1, in this case, if Nakul chooses 2 or 7, Akshat will choose 100 and win the game. Hence, output is true.