



HOME TOP CONTESTS GYM **PROBLEMSET** GROUPS RATING EDU API CALENDAR HELP GRAKN FORCES 🕎 10 YEARS! **

SUBMIT STATUS STANDINGS CUSTOM TEST PRORI FMS

A. Arena of Greed

time limit per test: 2 seconds memory limit per test: 256 megabytes input: standard input output: standard output

Lately, Mr. Chanek frequently plays the game Arena of Greed. As the name implies, the game's goal is to find the greediest of them all, who will then be crowned king of Compfestnesia.

The game is played by two people taking turns, where Mr. Chanek takes the first turn. Initially, there is a treasure chest containing N gold coins. The game ends if there are no more gold coins in the chest. In each turn, the players can make one of the following moves:

- · Take one gold coin from the chest.
- Take half of the gold coins on the chest. This move is only available if the number of coins in the chest is even.

Both players will try to maximize the number of coins they have. Mr. Chanek asks your help to find the maximum number of coins he can get at the end of the game if both he and the opponent plays optimally.

Input

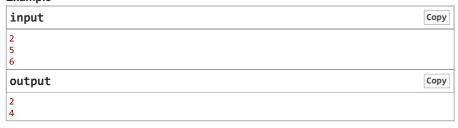
The first line contains a single integer T ($1 \le T \le 10^5$) denotes the number of test cases.

The next T lines each contain a single integer N ($1 \le N \le 10^{18}$).

Output

T lines, each line is the answer requested by Mr. Chanek.

Example



Note

For the first case, the game is as follows:

- 1. Mr. Chanek takes one coin.
- 2. The opponent takes two coins.
- 3. Mr. Chanek takes one coin.
- 4. The opponent takes one coin.

For the second case, the game is as follows:

- 1. Mr. Chanek takes three coins.
- 2. The opponent takes one coin.
- 3. Mr. Chanek takes one coin.
- 4. The opponent takes one coin.

2020 ICPC, COMPFEST 12, **Indonesia Multi-Provincial** Contest (Unrated, Online Mirror, ICPC Rules, Teams Preferred)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language:	GNU G++17 9.2.0 (64 bit, r 🗸
Choose file:	Choose File No file chosen
	Submit

→ Contest materials

•	Announcement (en)
	Statements #1 (id)

_	Statemente #2	(on)	

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