

PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

E. Easy Scheduling

time limit per test: 2 seconds
memory limit per test: 1024 megabytes
input: standard input
output: standard output

Eonathan Eostar decided to learn the magic of multiprocessor systems. He has a full binary tree of tasks with height h . In the beginning, there is only one ready task in the tree — the task in the root. At each moment of time, p processes choose at most p ready tasks and perform them. After that, tasks whose parents were performed become ready for the next moment of time. Once the task becomes ready, it stays ready until it is performed.

You shall calculate the smallest number of time moments the system needs to perform all the tasks.

Input

The first line of the input contains the number of tests t ($1 \leq t \leq 5 \cdot 10^5$). Each of the next t lines contains the description of a test. A test is described by two integers h ($1 \leq h \leq 50$) and p ($1 \leq p \leq 10^4$) — the height of the full binary tree and the number of processes. It is guaranteed that all the tests are different.

Output

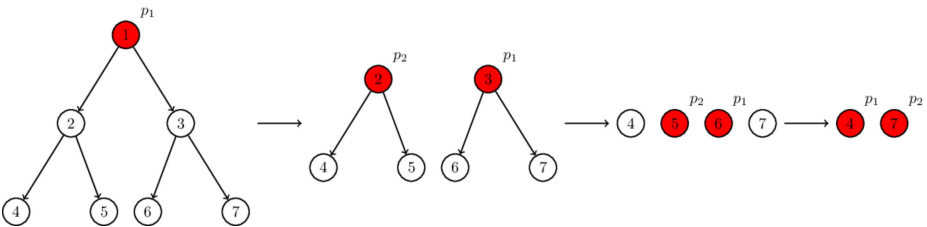
For each test output one integer on a separate line — the smallest number of time moments the system needs to perform all the tasks.

Example

input	Copy
3 3 1 3 2 10 6	
output	Copy
7 4 173	

Note

Let us consider the second test from the sample input. There is a full binary tree of height 3 and there are two processes. At the first moment of time, there is only one ready task, 1, and p_1 performs it. At the second moment of time, there are two ready tasks, 2 and 3, and the processes perform them. At the third moment of time, there are four ready tasks, 4, 5, 6, and 7, and p_1 performs 6 and p_2 performs 5. At the fourth moment of time, there are two ready tasks, 4 and 7, and the processes perform them. Thus, the system spends 4 moments of time to perform all the tasks.



ICPC WF Moscow Invitational Contest - Online Mirror (Unrated, 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: PyPy 2.7.13 (7.3.0)

Choose file: Choose File No file chosen

Submit

→ Last submissions		
Submission	Time	Verdict
204665135	May/05/2023 23:17	Wrong answer on test 1
204664730	May/05/2023 23:12	Time limit exceeded on test 3
204664631	May/05/2023 23:11	Time limit exceeded on test 3
204663658	May/05/2023 22:59	Accepted
204663478	May/05/2023 22:57	Wrong answer on test 1
204663417	May/05/2023 22:56	Wrong answer on test 1
204663190	May/05/2023 22:53	Runtime error on test 1

204663001	May/05/2023 22:51	Time limit exceeded on test 3
204662190	May/05/2023 22:41	Wrong answer on test 1
204662110	May/05/2023 22:41	Compilation error

[→ Problem tags](#)[implementation](#) [math](#) [*1200](#)

No tag edit access

[→ Contest materials](#)

- Announcement (en) [×](#)
- Statements (PDF) (en) [×](#)
- Tutorial (PDF) (en) [×](#)

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