

Project Euler #148: Exploring Pascal's triangle.

This problem is a programming version of [Problem 148](#) from [projecteuler.net](#)

We can easily verify that none of the entries in the first seven rows of Pascal's triangle are divisible by 7:

				1				
			1		1			
		1		2		1		
	1		3		3		1	
	1	4		6		4	1	
1	5	10		10	5	1		
1	6	15	20	15	6	1		

However, if we check the first one hundred rows, we will find that only 2361 of the 5050 entries are *not* divisible by 7.

Find the number of entries which are *not* divisible by 7 in the first N rows and first R columns of Pascal's triangle. Here, "column" means a column when the triangle is written this way:

1						
1	1					
1	2	1				
1	3	3	1			
1	4	6	4	1		
1	5	10	10	5	1	
1	6	15	20	15	6	1
⋮						

Since the answer can be very large, output it modulo $10^9 + 7$.

Input Format

The first line of input contains T , the number of test cases.

Each test case consists of one line containing two integers, N and R , separated by a space.

Constraints

$$1 \leq T \leq 3 \times 10^4$$
$$0 \leq R \leq N \leq 10^{18}$$

Test files #01-#03: $N \leq 5000$

Test files #04-#06: $R = N$

Test files #07-#09: $R \leq 5000$
Test files #10-#12: $N - R \leq 5000$
Test files #13-#15: No additional constraints.

Output Format

For each test case, output a single line containing a single integer, the answer for that test case.

Sample Input

```
3
5 3
100 100
100 50
```

Sample Output

```
12
2361
1622
```

Explanation

In the first test case, the following are the entries in the first **5** rows and first **3** columns: (highlighted in bold)

1						
1	1					
1	2	1				
1	3	3	1			
1	4	6	4	1		
1	5	10	10	5	1	
1	6	15	20	15	6	1
⋮						

There are **12** entries all in all, and they are all not divisible by **7**. Thus, the answer is **12**.

The second test case is mentioned in the problem statement.