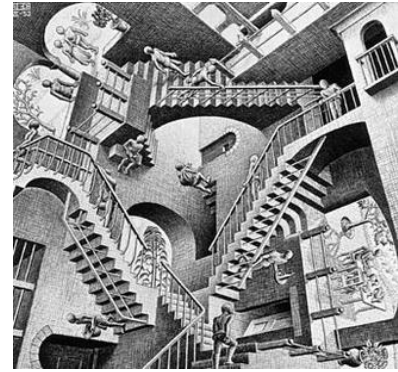


Problem F: Football Figurines

Time limit: 2 seconds

Frank is an avid football fan and of course attends the final game live in the Olympic football stadium. It is a huge building, and Frank is impressed by the maze of staircases connecting the n floors.

Frank notices that from each floor there are exactly two staircases going up, one to the floor directly above and one to the floor two levels up (skipping the floor directly above). On each staircase, a volunteer is distributing little figurines to the spectators, giving one figurine to everyone climbing up this staircase.



M.C. Escher, Relativity

There may be many different routes between any two floors, where a route consists of a sequence of staircases. Note that, because of the mass of spectators heading to their seats, Frank can only take staircases going up. Frank is wondering how many figurines he can collect when walking up again and again but taking a different route each time. He considers two routes to be different if they differ in at least one staircase.

Given several queries, each consisting of a pair of two floors, find the maximum number of figurines Frank can collect when climbing up all the different routes between those floors.

Input

The input consists of:

- One line containing two integers n and q ($1 \leq n \leq 10^6$, $1 \leq q \leq 5 \cdot 10^4$), the number of floors and the number of queries, respectively.
- q lines, each containing two integers s and t ($1 \leq s \leq t \leq n$), the numbers of two floors.

The n floors are numbered from 1 to n .

Output

For each query, output the total number of figurines Frank can collect when climbing up all different routes between the two floors. Since this number can be very large, output it modulo $10^9 + 7$.

Sample Input 1

```
5 4
1 1
2 3
1 3
1 5
```

Sample Output 1

```
0
1
3
15
```

Sample Input 2

```
1000000 1
1 1000000
```

Sample Output 2

```
884826434
```

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