

E: Beacon Deployment

Standard I/O | Time Limit: 1.0s | Memory Limit: 512MB

A planetary defense dome is modeled as a square grid with rows and columns numbered 0 to 2^N . Cells on the perimeter (row 0, row 2^N , column 0, column 2^N) are permanently fortified with automated sentinels. The interior contains $(2^N - 1) \times (2^N - 1)$ available sites for beacon placement at (r, c) with $1 \leq r, c \leq 2^N - 1$.

Distance between two sites $(L1, C1)$ and $(L2, C2)$ is measured using the Chebyshev metric: $\max(|L1 - L2|, |C1 - C2|)$. Beacons are deployed sequentially one by one according to the following protocol:

- For every unoccupied interior site, compute the minimum distance to any already occupied site (either perimeter sentinels or existing beacons).
 - Deploy the new beacon at an unoccupied site whose minimum distance is maximized.
 - Tie-breaking rule: Choose the site with the smallest row index r ; if still tied, choose the smallest column index c .
- Given Q independent queries, determine the exact location (r, c) chosen by beacon K in a dome of size parameter N .

Input

The first line contains an integer Q ($2 \leq Q \leq 10^5$).

Each of the next Q lines contains two space-separated integers N and K ($2 \leq N \leq 30$, $1 \leq K \leq \min(10^9, (2^N - 1)^2)$).

Output

Print Q lines. The i -th line contains two space-separated integers (row, column) answering query i .

Standard Input	Standard Output
5	4 4
3 1	2 2
3 2	4 2
3 5	6 6
3 9	2 2
4 10	

