Problem J. Jumping Jumbo Jets

Time limit: 3 seconds

A new airline discount company called "Jumping Jumbo Jets" is planning to start its operations. One of the ways for airline discount companies to reduce expenses per flight is to minimize the time spent on airport operations, particularly the time spent on passenger boarding.

Boarding the plane through a boarding bridge is done as follows:

- Initially, the plane is empty, and all passengers stand in a queue right in front of the entrance to the plane.
- The plane has a total of n rows of seats, with one aisle.
- On each row, there are r seats to the right of the aisle and l seats to the left of the aisle.
- The width of the aisle is such that at most one passenger can be in the aisle near one row of seats at a time.
- We can imagine the plane as a rectangular grid of height n and width $r + 1 + l$, where each square can be occupied by at most one passenger that has not yet taken her seat.
- After the boarding starts, the passengers start moving simultaneously. Motion is discrete, and moving to an adjacent square of the grid takes one second.
- Each passenger has a predefined path: she is going to walk along the aisle from the entrance to her row, then turn towards her seat, then walk to the square adjacent to her seat, and then take her seat.
- Sometimes passengers have to be standing instead of walking. A passenger is said to be *standing* when she turns or when she waits for another passenger standing in front of her.

During each second, all passengers that have not yet taken their seats proceed simultaneously as follows:

- If the passenger has to walk, and there is no other passenger standing on the next square of her path, she spends the second walking to the next square.
- If the passenger has to walk, but some other passenger is standing (not walking) on the next square of her path, she just waits for a second, standing.
- If the passenger has to turn, it takes one or two seconds. During that time, she is standing.
- When the path to her seat is clear, turning takes only one second.
- When, on her way, she will have to pass through at least one passenger who will be seated **at the moment of her passage**, she has to turn and politely ask for passage at the same time. In this case, turning takes two seconds, regardless of the number of passengers to pass through.
- For example, if a passenger has a window seat, and the seat one row away from the window is already occupied (or will be occupied when the passenger arrives there; we assume that each passenger knows the seats of all other passengers), turning takes two seconds.
- When the passenger arrives at the square adjacent to her seat, she sits down immediately.
- For example, if the seat is adjacent to the aisle, the passenger spends no more time after turning.
- For another example, if the passenger has the place two seats away from aisle, she spends one second for turning (or two seconds if at least one of the two places near the aisle will be occupied when she moves through them), then two seconds for moving along the row; at the next second, she has already taken her seat.

Boarding is considered complete when all passengers have taken their seats.

All seats on the flight have been sold and all passengers have checked in for the flight. The airline plans to line up the passengers in a queue at the airport in such a way that the total time spent on boarding is minimized. Given the values of n, r, and l, determine the minimum time required to complete the boarding process and the number of ways the airline can line up all passengers in the queue to achieve the optimal time. Two ways are considered different if there is at least one position in the queue where passengers with tickets to different seats are standing.

Since the number of ways can be very large, output it modulo 998 244 353.

Input

The first line of the input contains one integer t ($1 \le t \le 100$) — the number of scenarios. Each of the following t lines contains one scenario — three integers n, r, and l ($1 \le n, r, l \le 10^6$).

Output

For each scenario, print two integers: the minimum number of seconds required to complete the boarding process and the number of ways to achieve the minimum boarding time modulo 998 244 353.

Example

standard input	*standard output*
2 3 2 2 1 1 1	16 864 4 2