Casino Game

Stupid Casino Game: The REU Casino had the following game: You bet \$1.00. The house just *says* WIN or LOSE. NOBODY played since they feared that the casino would always say LOSE and the game was not fun (unlike Ramsey Games).

The REU Casino changed the rules.

Good Casino Game: You have \$1.00 (infinitely divisible, e.g., you can bet $1/\pi$ dollars). You will place TWO bets The house has to say WIN for one of them and LOSE for the other. (What you bet in the second round may depend on what happens in the first round.)

1. What is the optimal strategy for the good casino game. That is, how much should you bet in the first and second rounds to maximize your profit?

2. What if you can bet THREE times and the casino can only say LOSE only once? FOUR times? etc.

3. What if you bet THREE times and the casino promises will say LOSE only twice.

4. What if you bet n times and the casino promises will say LOSE only twice.

Generalize to betting n times and losing only L times.