Study guide

- The gambler's ruin scenario basically asks what happens when we repeatedly play a game where we can win or lose whatever money we wagered until we run out of money (or someone else runs out of money.
- These types of problems are often framed in terms of pure gambling, but the same analysis applies to problems in finance. With real gambling, the expected return on your investment (bet) is usually negative in the long run, whereas with financial investment the expected return is usually positive.
- In the previous session, we discussed options pricing. In this session, we analyze how to maximize our expected gain and minimize the probability of running out of money when buying options.
- As with other scenarios we have seen in this course, simulations are a powerful tool for answering questions about the results of trying out different strategies in situations involving decision making with probabilistic outcomes.
- When making investment decisions, it is not enough to be able to predict whether the price of something will go up or down, you also have to decide how much of your available money to risk on that investment.
    - If you risk too much, you might go broke.
    - If you risk too little, you are not taking enough advantage of the available gains. (And if your percentage return is less than inflation, you are effectively losing money anyway.)
- Given that all predictions are probabilistic (for example, the price will go up with 70% probability) there is always the possibility of losing money on an investment. The idea is to have a positive average return in the long run, even if you lose some money in the short run. The question then is, how do we decide how much money to risk on an investment if there is a possibility of losing that money?