Pre-class work

Create a Google document and record your work and all exercises. **Make sure the Google document is shared** so that it can be assessed, and **be ready to paste a link to your document into a class poll**.

Do the following two exercises from Shonkwiler Chapter 1, page 44.

- **Exercise 8: Random walk with drift**

    8. (5) (Random walk with drift) Use a biased coin to simulate a random walk of 30 steps on the line. If the coin falls heads (H), take one step to the right, if it lands tails (T), take one step left. After 30 steps, note the final position. Take $\Pr(H) = 0.6$ and $\Pr(T) = 0.4$. (a) Plot a sample path. (b) Make a histogram for 200 such random walks. (c) Report the sample mean. (d) Report the sample variance. (What should these be exactly?)

- **Exercise 9: Gambler's ruin with time limits**

    9. (4) (Gambler's ruin with time limits) Modify the simulation code in Section 1.1.3 starting on page 8 for the gambler's ruin problem, but with various upper bounds on the iteration count. How does this bias the average duration of the game? How does this bias the sample variance?

Finally, if you haven't heard of the **Monty Hall problem** before (or have forgotten what it is) read the description of the problem on page 24. Consider what your approach would be — do you have a better, worse or the same probability of winning the car if you switch doors? Be ready to motivate your answer. We discuss and simulate a modified version of this classic problem in class.