LARSON—MATH 255–CLASSROOM WORKSHEET 22
Coin Flip Experiments.

1. (a) Start the Chrome browser.
   (b) Go to `http://cocalc.com`
   (c) Login using **your VCU email address** .
   (d) Click on our class Project.
   (e) Click "New", then "Worksheets", then call it **c22**.
   (f) For each problem number, label it in the Sage cell where the work is. So for Problem 2, the first line of the cell should be `#Problem 2`.

A Formula for Primes?

2. When $n = 0$, $n^2 - 79n + 1601$ is 1601—which is prime. When $n = 1$, $n^2 - 79n + 1601$ is 1523—which is prime. Find the smallest value of n where $n^2 - 79n + 1601$ is *not* prime.

Streaks of Heads and Tails

3. Use our previously defined functions to generate a list of 100 coin flips called `flip_data`.

4. Now we need to find a longest streak of heads or tails in our data. One way to do it it to first find the length of the streak that starts at any specified index in your `flip_data`. Define a function `streak_at_i(flip_data,i)` that inputs a list of 'H' and 'T' strings, an index i, and returns the length of the streak whose first term is `flip_data[i]`. Test it on some data to see if its working.

5. Now we have a tool we can to a longest streak of heads or tails in our data. Use `streak_at_i(flip_data,i)` for $i \in [0..99]$ and keep track of the largest value you get.

6. Now repeat this experiment 1000 times to estimate the average length of a longest streak of heads or tails when you flip a coin 100 times.

7. Estimate the the average length of a longest streak of heads or tails when you flip a coin 200 times.

Getting your classwork recorded

When you are done, before you leave class...

(a) Click the "Make pdf" (Adobe symbol) icon and make a pdf of this worksheet. (If Cocalc hangs, click the printer icon, then "Open", then print or make a pdf using your browser).

(b) Send me an email with an informative header like "Math 255 - c22 worksheet attached" (so that it will be properly recorded).

(c) Remember to attach today's classroom worksheet!