

LARSON—MATH 353—HOMEWORK WORKSHEET 01
The Birthday Problem.

1. Log in to CoCalc.
 - (a) Start the Chrome browser.
 - (b) Go to `https://cocalc.com`
 - (c) Login (**your VCU email address** is probably your username).
 - (d) You should see an existing Project for our class. Click on that.
 - (e) Click “New”, then “Worksheets”, then call it **h01**.
 - (f) **Annotate your work carefully and completely. In particular, write problem numbers, and explanations.**

A problem to think about: the Birthday Problem. If there’s 366 students in a room some pair of them are guaranteed to have the same birthday (month & day) . If there are only 2 students in a room they are very unlikely to have the same birthday. How many students do we need in order for the probability to be at least $\frac{1}{2}$ that at least one pair of students has the same birthday?

The motivation of this assignment:

- (a) To **explain** what we did on the Birthday Problem, and
 - (b) To copy-and-paste code from what we’ve done successfully. (This means you need to either already understand what we did—or ask questions to make sure you **do** understand.)
2. Write code to estimate the probability that 5 students in a room have the same birthday. Explain what you did and what the code means.
 3. Run this code in a loop 100 times, 1000 times and 10000 times. Report your results in English, in the next cell after you run these experiments.
 4. Write code to estimate the probability that 25 students in a room have the same birthday. Explain what you did and what the code means.
 5. Run this code in a loop 100 times, 1000 times and 10000 times. Report your results in English, in the next cell after you run these experiments.

Getting your homework 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 353 - h01 worksheet attached” (so that it will be properly recorded).
- (c) Remember to attach today’s classroom worksheet!