

LARSON—MATH 353—HOMEWORK WORKSHEET h07
Digital Dice.

1. Log in to your Sage Cloud account.
 - (a) Start the Chrome browser.
 - (b) Go to `http://cloud.sagemath.com` and sign in.
 - (c) You should see an existing Project for our class. Click on that.
 - (d) Click “New”, call it **h07**, then click “Sage Worksheet”.

2. **Navy.** The Navy estimates that there is a $1/3$ chance of shooting down an attacking aircraft. What is the probability of shooting it down if 4 missiles are fired?
Define a function `experiment_navy()` that simulates 4 “shots”, and produces and output representing whether or not the missile hit its target. Then repeat this experiment lots of times and calculate an *estimate* of the probability of success.

3. Calculate the *mathematical* probability of shooting down an aircraft if 4 missiles are fired.

4. **Presidents.** The quiz question asks a student to match 4 Presidents to 4 years they started their Presidency. The student randomly guesses (matching each President to one of the 4 years). How many Presidents will the student match correctly on average?
Define a function `experiment_presidents()` that simulates a random choice of 4 Presidents to 4 years and outputs the number of correct matches. Then repeat this experiment lots of times and calculate the average number of correct matches.

5. The last answer was *empirical*—based on repeating experiments. Now calculate the *mathematical* answer. (In class we made a table of possibilities).

6. **Another Clumsy Dishwasher.** There are 5 dishwashers. 5 dishes are broken one week—3 by the same dishwasher! Is the dishwasher clumsy or unlucky? What is the probability a dishwasher will break at least 3 dishes—under the assumption that the dishes are broken randomly (that is, with equal probability)?
Define a function `experiment_dishwasher()` that simulates this situation. Then repeat this experiment lots of times. How would you answer our question?

Getting your homework recorded

When you are done...

- (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—h07 worksheet attached” (so that it will be properly recorded).
- (c) Remember to attach your homework worksheet!