

CT248: Introduction to Modeling

Assignment 1: Using Functions to Simulate Two Dice Rolls

Consider the following script:

```
clear;
d = roll_2_dice(10000, 100);
[freq, prop] = tabulate_2_dice(d);

disp(freq);
disp(prop);
```

This generates the following variables:

```
>> whos
  Name      Size      Bytes  Class  Attributes
  d         1x10000    80000  double
  freq      1x12       96     double
  prop      1x12       96     double
```

Where

- d is the simulated dice rolls in a row vector.
- freq is a 1 x 12 array that contains the frequency of each combination. For example, freq(1) should always be zero, as the minimum combination of rolls is 2 (1+1). You would expect freq(7) to be the highest (1/6 of all outcomes).
- prop is a 1 x 12 array that contains the proportions of each outcome.

For example, the outcome of the number seven is shown below.

```
>> freq(7)
ans = 1655

>> prop(7)
ans = 0.1655
```

Your task is to implement the functions roll_2_dice and tabulate_2_dice. These are summarised below.

Function	Description	Inputs	Outputs
roll_2_dice	Generates a simulation of two dice throws, with a specified seed.	N seed	1xN vector
tabulate_2_dice	Based on a set of dice throws, calculates the frequency and proportion of each outcome.	Throws	Frequency and proportions tables