MTH 337, Sample Quiz 6
Spring 2021

You will have **15 minutes** to take the actual quiz in Gradescope. The quiz will start exactly **5 minutes** after the start of class, 9:15 AM, and will close at 9:30 AM.

1. Write a function that performs n trials of the following random event and aggregates the results: the sum of the outcomes of three consecutive rolls of a 6-sided dice.

2. Write a function that will automatically plot the aggregated results of the function in part 1.

3. A Fibonacci sequence is a sequence of numbers governed by the recursive formula

$$F_{n+1} = F_n + F_{n-1}$$

. Such a sequence depends on two initial values F_0 and F_1. Write a function that will calculate the bifurcation curve showing the dependence of F_100 on the first initial value F_0.

4. Use numpy commands to recreate the following matrix:

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 2 & 2 & 0 \\ 0 & 3 & 1 & 1 & 1 & 2 & 2 & 0 \\ 0 & 3 & 3 & 3 & 2 & 2 & 2 & 0 \\ 0 & 3 & 3 & 3 & 3 & 0 & 0 & 0 \\ 0 & 3 & 3 & 3 & 3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$