Risk analysis lab 2019. 09. 24. (Introduction, part 3.)

1. Create a new notebook (`lab1.ipynb`) and
   a. define variable **A**, **b** and c:

$$\mathbf{A}=\begin{bmatrix} 1 & \frac{1}{2} & \frac{1}{3} \\ \frac{1}{2} & 1 & \frac{1}{3} \\ \frac{7}{3} & \frac{2}{3} & 1 \end{bmatrix},\ \mathbf{b}=\begin{bmatrix} 2 \\ 5 \\ 6 \end{bmatrix},\ c=\frac{2}{8}.$$

   b. Solve the $\mathbf{Ax}=\mathbf{b}$ linear equation system and print **x**. (help)
   c. Multiply the last row of **A** and the last element of **b** by `c`. Solve the linear equation system again and print **x**. What do you expect? Why?
   d. Print the maximal eigenvalue and the corresponding eigenvector of matrix **A**. (help)

2 points

2. Plot the sine function over the domain $-2\pi < t < 2\pi$.
   a. Use `numpy.arange()` to define the range.
   b. The increment between the elements should be 0.01.
   c. You can use the `numpy.pi` constant.

1 point

3. Create function `r = genBinVec(M,N,p)` that generates `M` binary vectors using the random number generator, containing `N` independently drawn element with `p` probability of being 1, i.e. $P(r_i = 1) = p$.
   a. Store in a `NxM` array or matrix

2 points