First Lab Assignment (Due by 3pm on Feb. 18)

Reference MATLAB tutorial and MATLAB lab demonstrations.

Lab assignments

Assignment 1 Please complete following sequence of problems in MATLAB:

- create a matrix A with 5 rows and 3 columns, filled with random variables between 0 and 10
- create an identity matrix B with the size of 3 times 3
- get the submatrix C of A by extracting the elements of the last three rows
- perform element-wise multiplication between matrix B and matrix C. The result is denoted as the matrix D
- concatenate A and D to form matrix E, whose first 5 rows are from A and the last 3 rows are from D
- plot a histogram of each column of matrix E, what can you tell about the distribution of values in columns? (Please label the axes and add a title. You should also specify other properties such as the line width, the font size and the color. Please save the figure as .png)
- write a **function** to calculate intersection between two sets $A = 1 : 5 : 200$ and $B = 1 : 3 : 190$.

Please submit both of your MATLAB codes and the plotted figure.

Assignment 2 Given a dice with six numbers ($\{1, 2, 3, 4, 5, 6\}$), each number comes with the same probability when you roll it. Here is the game. Suppose you have such TWO dices and you simultaneously roll both of them to get the product of the two output numbers. When the product is 1 or 36, we say that you get the magic numbers and you will be rewarded. However, each play will cost you a certain amount of money and you can only afford to play 100 times. Let the random variable X denote the total number of times you will hit those magic numbers and be rewarded. Image you are repeating this game a 1000 times, and counting how many times have you won during each game. You have to show the distribution of getting the magic numbers by plotting the histogram.

Please submit both of your MATLAB codes and the plotted figure.

Assignment 3 Given a dice with six numbers ($\{1, 2, 3, 4, 5, 6\}$), each number comes with the same probability when you roll it. Suppose you have such THREE dices and you simultaneously roll all of them to get the sum of those three output numbers. When the sum is 3 or 18, you win. Otherwise, you lose. You are so addicted to this game and will not stop until win it once (get 3 or 18 in one play). Let the random variable Y denote the number of plays when you stop playing. You have to repeat the game several times (1000) and plot the histogram of how many times did you tossed the three dice before you reached 3 or 18.

Please submit both of your MATLAB codes and the plotted figure.