

First Lab Assignment (Due by 12pm on Oct. 4)

Reference MATLAB tutorial and MATLAB lab 1, 2 and 3 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 Three birthday problem (ref. link to the three birthday problem discussion): Hint, it is the well known two birthday problem, however, the probability of $P(B_n)$ should be probability of no three coincident birthdays for $n = 1, 2, \dots, 100$.

You should:

- implement a **function** (e.g., `threeBirthdaysProblem(n)`) in Matlab to compute the probability of no coincident birthdays in a group of n arbitrarily chosen people. This function takes one input argument, n and return the computed probability
- plot the figure of $P(B_n)$ for $n = 1, 2, \dots, 100$ similar to the one demonstrated in the lab 3. In order to plot the probabilities you have to call the defined function (e.g., `threeBirthdaysProblem`) to compute the probability for different values of n .

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