

Lab 1: Matlab introduction

Due date: Wednesday 09/04/13 11:59pm by email.

1. Generate 10000 uniform random coordinates, store them in an array and plot them. [output: a figure, label axes]
2. Generate a histogram a histogram for the X and Y coordinates and show them in the same plot. [output: a figure, label axes]
3. How random are these random numbers, we can test this using considering a summary statistic, where we calculate the mean of the X and Y coordinates, for a standard random number in the range of 0 to 1 the mean should be 0.5. Is that true for your random numbers? Report the mean of your X and Y coordinates and also the difference from the expected mean 0.5). [output: sample mean, deviation from the expected mean]
4. Create a function that takes the array as input and generates a square with random minimum (x_{\min}) and maximum (x_{\max}), calculate the expected mean (since this is square that will be $(x_{\max} + x_{\min})/2$, now find the random values of your array that fall within this square and calculate the mean; calculate the deviation (expected mean - sample mean). The output of the function is x_{\min} , x_{\max} , the sample mean, the expected mean, and the deviation. [output for the report: show your function, and give the results for 3 trials]