MSPR 1 MATLAB Exercises (Due: Monday 14.9.2015 12h)

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1 Feedback

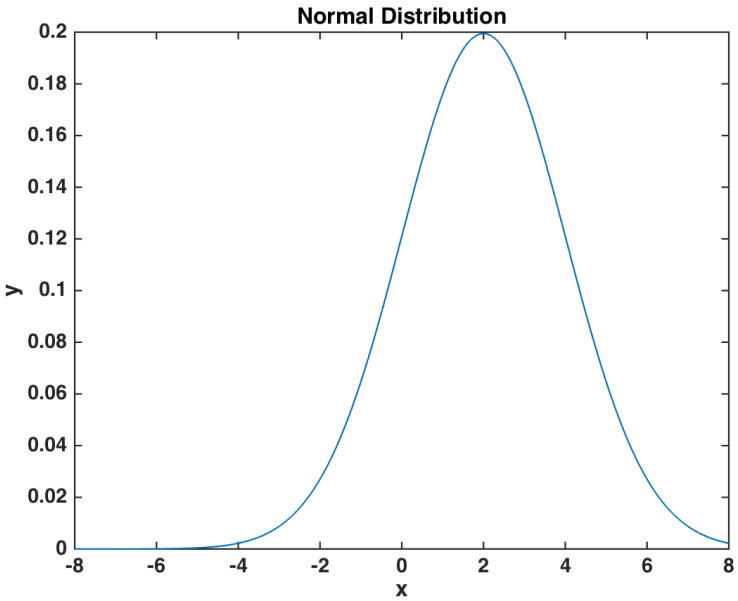
1. Please give us feedback on the last lecture and homework: `http://goo.gl/forms/t97Jt9Y9V0` Thanks!

2 Plotting Functions

Plot the function

$$\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

for x in the range of -8 to 8 in steps of 00.1. Find the right values for parameters μ and σ so that it looks like the following curve: (15 P)



3 Reading/Writing Text and Binary Matlab Files

Download the text file "numbers.txt".

1. Write a function `analyzeNumbers` that reads floating point numbers from a text file and returns their minimum `mini`, maximum `maxi` and average `ave`. The function should also save the numbers, the values named `mini, maxi, ave` in a `.mat` file and write a message on the screen with a sentence giving out the values of mini, maxi and ave in a format like : `Minimum: 0.65, Maximum: 3.10, Average: 2.10` (25 P)

2. Call the function with the file name `numbers.txt`. Clear the workspace. Load the numbers and the results from the .mat file and check if they are the same. (5 P)

4 Reading Data from UCLA Website and Scatter Plots with PRTools

Get the `adult` census data set from the UCLA Website `http://archive.ics.uci.edu/ml/`. Read `adult.names` to understand the data. Make a scatter plot of age and and hours-per-week work time using the two classes ('$<= 50K$' and '$> 50K$' income a year) How many 'poor' ('$<= 50K$') and 'rich' ('$> 50K$') people are there in the 'adult' data set? (35 P)

5 Cutting and remixing a multi-track sound recording

Download the sound files bass.wav and vox.wav.

1. Load `bass.wav` and `vox.wav` into Matlab. Remix bass and voice to have a clear dominance of the voice. Use Matlab to listen to the remix and plot the bass waveform over the remix. (10 P)

2. Remix bass and vox to have a clear dominance of the bass. (10 P)

6 Linear Algebra Preparation

1. Watch Kahn Academy: `https://www.khanacademy.org/math/precalculus/precalc-matrices/matrix_multiplication/v/matrix-multiplication-intro`

2. Perform two attached matrix multiplications (exercises attached to the video).

7 Self Assessment

Check the exercises that you have seriously worked on.

2	3.1	3.2	4	5.1	5.2