Assignment 1

Machine Learning COMS 4771

Spring 2014, Itsik Pe’er

Assigned: Jan 22nd Due: Class time, Feb 3rd

Submission: Your submission folder on Courseworks

1. Explain the academic honesty policy for the class and state your commitment to that policy.

[10 points]

1. Sign up to Khan Academy with your Columbia email. Set [ml4771.f14@gmail.com](mailto:ml4771.f14@gmail.com)

as your coach. Make sure you are comfortable with the material in the sections *Random variables and probability distributions* and *Inferential Statistics*, and solve all tasks in those sections.   
[20 points]

1. Make sure you can effectively use MATLAB. Write a MATLAB function that simulates housing prices in the Columbia campus area, assuming the price of a housing unit depends on the size of the apartment, its location (higher as you go west and south), and floor it is on.  
   The function Prices = SimHousingPrices(Market, StdDev, Houses)  
   should receive as input:  
   Market: The parameters of the housing market - a column vector of size 5, whose

coordinates are (*a,b,c,d,e*)T where  
*a* is the price increase per square foot  
*b* is the price increase per avenue, going west  
*c* is the price difference per cross street, going north  
*d* is the price increase per floor   
*e* is the fixed component of the price

StdDev: A non-negative scalar *σ*  that denotes the scale of fluctuation of the price of a housing unit given the size, location and floor for that apartment.

Houses: Data regarding the *N* housing units for which price should be simulated - a matrix of size *N*×4, whose *i*-th row lists area, avenue, street and floor for the *i*-th housing unit.

The function should provide as output:  
Prices: The prices for the *N* units as a column vector. Each price needs to be a linear

combination of the corresponding row of Houses, with coefficients (*a,b,c,d*) ,

plus the fixed cost *e*, plus a simulated value of a normally-distributed random  
variable, with mean zero and variance *σ* 2 .

Please submit SimHousingPrices.m in a folder called Assignment01.Problem03  
in your CourseWorks dropbox [20 points]

Good luck!