**CSE483 Mobile Robotics**

**Assignment 3 on Probabilistic State Evolution**

**Due Date: 29th Sep 2015, 11.59pm**

* 1. Given a set of (x,y) values as (1,1), (1,-1), (0.5,0.7), (0.6,0.4), (1.2,0.9), (08,07), (0.9,1.1), (1.2,0.8), (1.3,0.9), (1.1,0.6), (0.8, 0.7), (0.9,0.8), (0.7,0.8), (0.9,1.2),(1.3,1.2) find the mean and covariance of this distribution.
  2. Assuming the above to be sampled from a Gaussian pdf, find the probability of x,y taking values (0.9,0.9), i.e. P(X = [0.9 0.9]T)
  3. Consider a robot precisely located at (0,0) with heading = 0 degrees. Let the robot turn by 30 degrees and move by 1m. Assume that the control noise is a diagonal matrix with variance in translation = 0.2 and variance in rotation = 4. Assuming control noise is Gaussian distributed what is the mean and covariance of the robot state after the above control is executed?
  4. What is the probability that the robot is at location (0.6,0.4).

For the above questions I would like to see how your approaching the problem in terms of clearly defined pedagogical steps. I am not so keen about the final answer but more concerned about your understanding that should reflect in the way you show the steps and the way you answer.