**Homework # 5 (Due day: Nov 20, Tuesday)**

Try to read Chapter 1 from any student who has that textbook on "Machine Learning and Pattern Recognition". Then answer the following questions.

Q1. Explain Bayesian Theorem. Try to use your own words to explain as many details (math, meaning, significance) as possible.

Q2. Explain curve fitting model from Maximum Likelihood (ML) viewpoint.

Q3. Then explain curve fitting model from Maximum A Posterior (MAP) viewpoint.

Q4. If we draw data points from a Gaussian distribution, use ML to seek its mean and variance.

Q5. What is overfitting problem in curve fitting? How do we overcome such an issue?

Q6. Use examples to explain marginal /joint / conditional distributions.

Q7. Use examples to explain sum rule and product rule in probability distributions.