CE956: Statistical Machine Learning
Department of Computer Engineering
Sharif University of Technology
Spring 2019: Room CE204, Sat. & Mon.: 13:30-15:00

Quiz 01 (30 Points) – (February-23-2019)

Linear Algebra: (10 Points)

Given the linear system Ax = b:

1. What is the Column representation of this linear equation? What do the columns of A represent?
2. What is a pivot, what is the relation between the pivot, inevitability of A and consistency of solution space?
3. What do Eigenvalues and Eigenvectors represent?
4. What are the properties of a circulant matrix?
5. What is a Markov Matrix?

Stochastic Processes: (14 Points)

1. Please explicitly define what a random process and random field means?
2. Please specify what are the weak and strong stationarity?
3. What is an ergodic process? What is the condition for a process to be ergodic?
4. What is a doubly stochastic process?
5. What is power spectrum of a stochastic process?
6. What is the relation between input and output spectrum an and LTI system with stochastic input?
7. What is the difference between the frequentist and Bayesian point of view?

Machine Learning: (6 points)

1. What is the difference between transductive and inductive learning?