

Probabilistic Graphical Models

Quiz-3

Issued on:
May 20, 2020

Due by:
May 21, 2020 11:59pm

Guidelines for submission

- Solutions should be submitted as a scanned Q3_RollNo.pdf file of your written solutions.
 - Alternatively, a solution can be prepared in doc/latex as well. For that please export it in .pdf format (as Q3_RollNo.pdf).
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1. (10 points): You are given the standard bivariate normal density function as:

$$f(x, y|\rho) = \frac{1}{2\pi\sqrt{1-\rho^2}} \exp\left(-\frac{x^2 - 2\rho xy + y^2}{2(1-\rho^2)}\right) \quad (1)$$

You need to sample the values of x and y from the given distribution. Use Gibbs sampling for the purpose and answer the following:

- (5 pt) How will you sample from the given distribution?
- (5 pt) In accordance with Gibbs sampling, write a brief algorithm for the sampling scheme.

Consider ρ to be a known constant. If required take $\rho = 0.5$

Hint: Since using Gibbs sampling method to sample from a bivariate joint distribution may not be directly applicable, you can alternatively consider obtaining conditional distributions and then go about sampling from that.