Ma323-LAB 06

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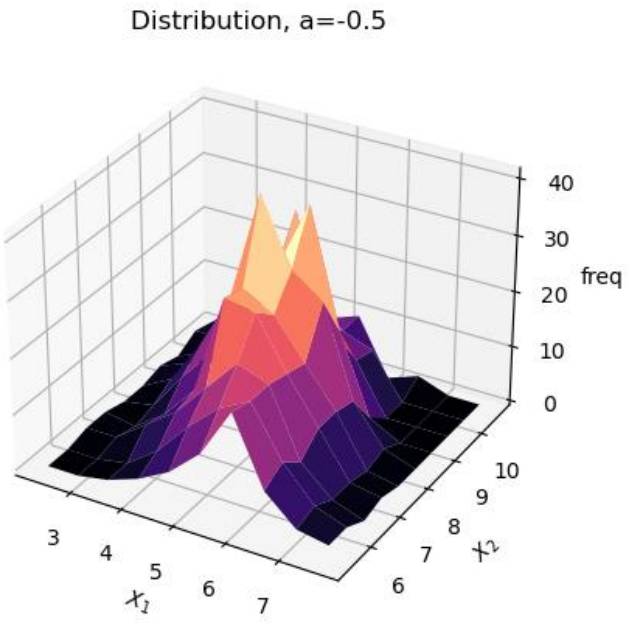
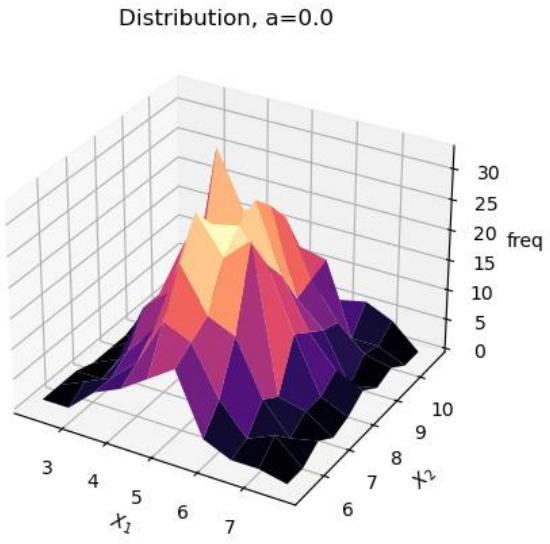
Question 1 and 2:

Generated bi-variate standard normal random distribution Z then converted it to given distribution with the help of X = μ + AZ where A was calculated with the help of Cholesky factorization and $\mu = (5,8)$ as given in the question.

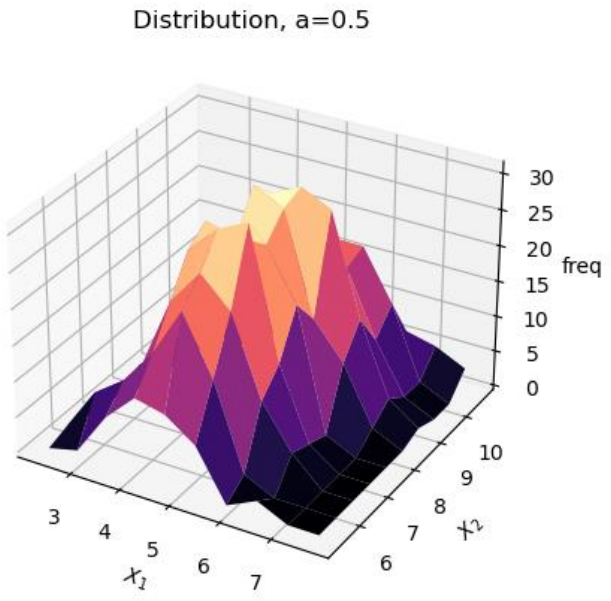
- Distribution generated for a sample size =1000 and a=-0.5



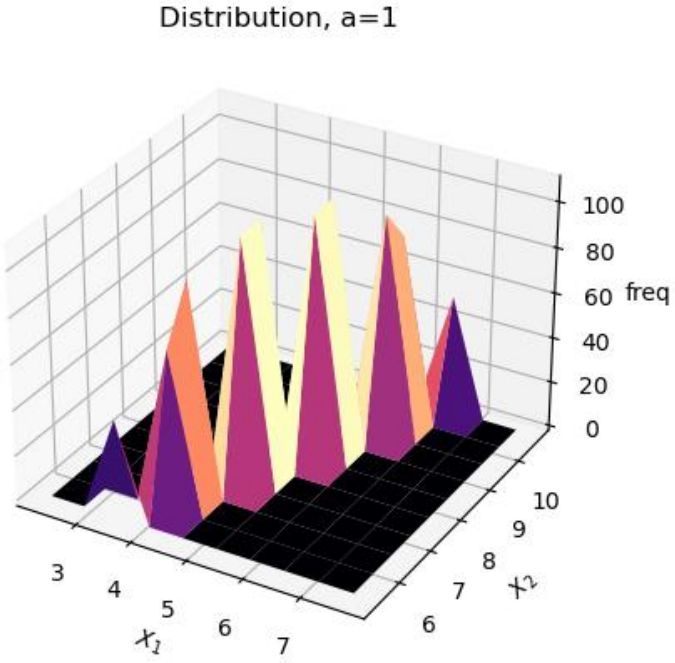
- Distribution generated for a sample size =1000 and a=-0.0



- Distribution generated for a sample size =1000 and a=0.5



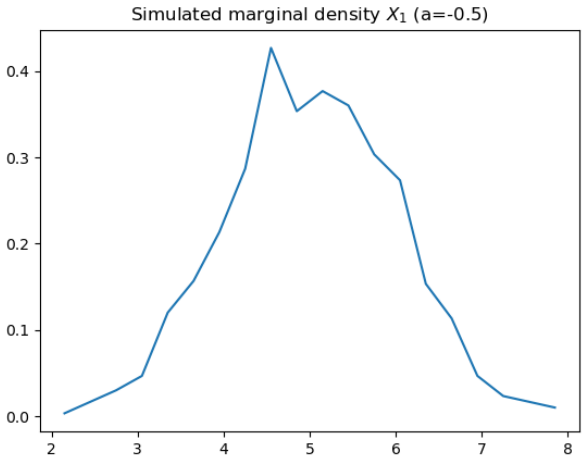
- Distribution generated for a sample size =1000 and a=1.0
  Note: For a=1 the distribution will not be ~~univariate~~ because ∑ is singular matrix (i.e. det|∑|=0).

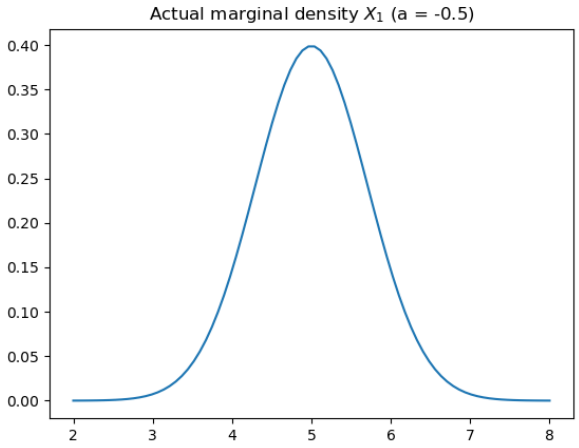


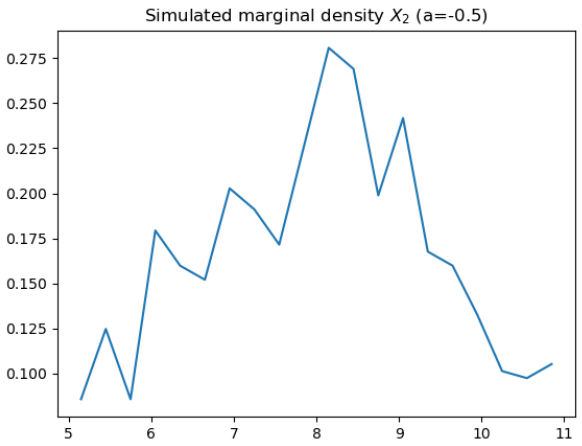
Question 3:

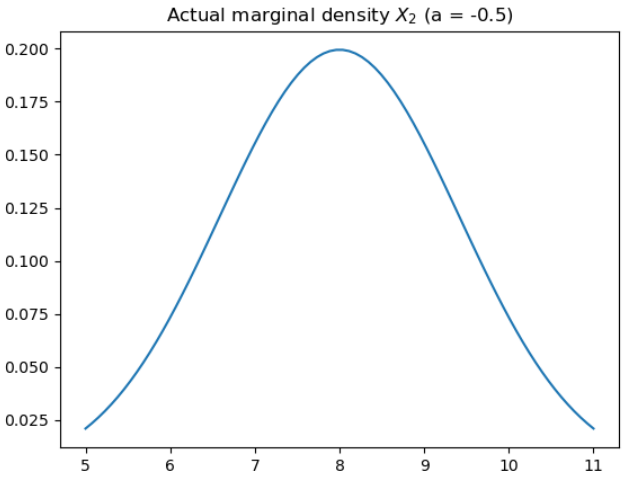
- The marginal densities and joint densities of the simulated distribution are shown below.
- Whereas I have generated the marginal densities of and joint distribution for the actual distribution which are also shown below.

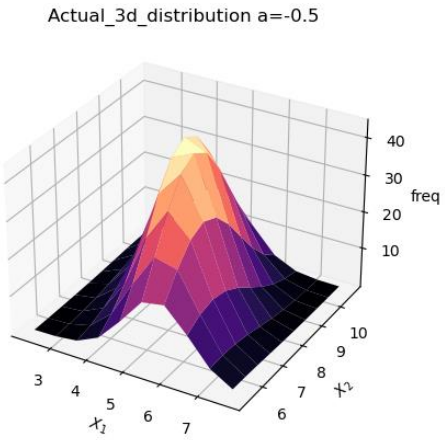
- When a=-0.5, the following simulated/actual marginal and joint densities/distribution are shown below:

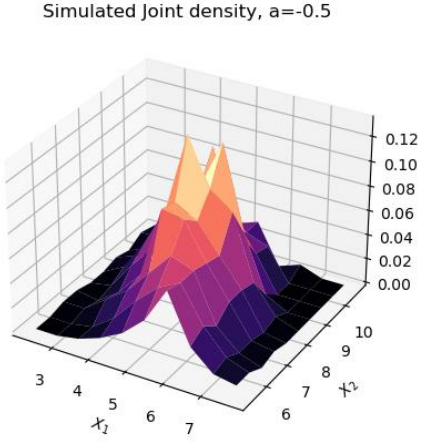




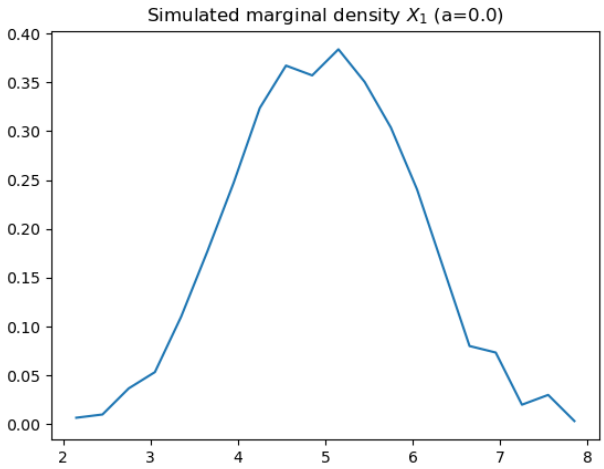


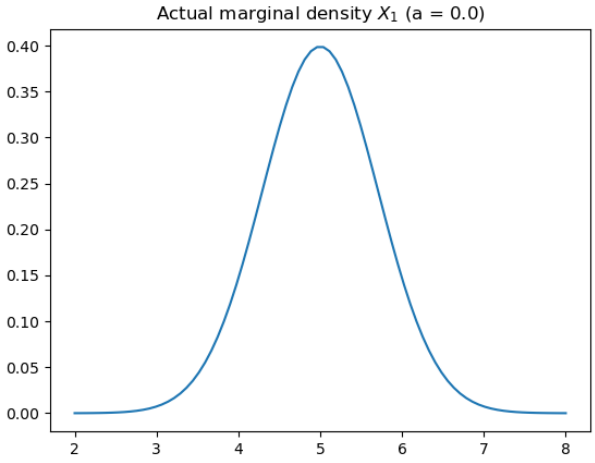


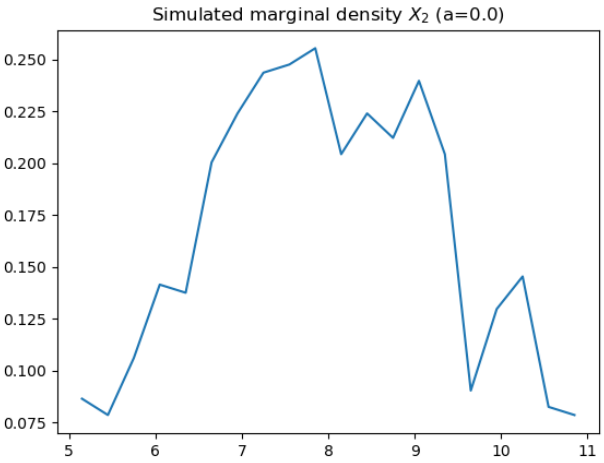


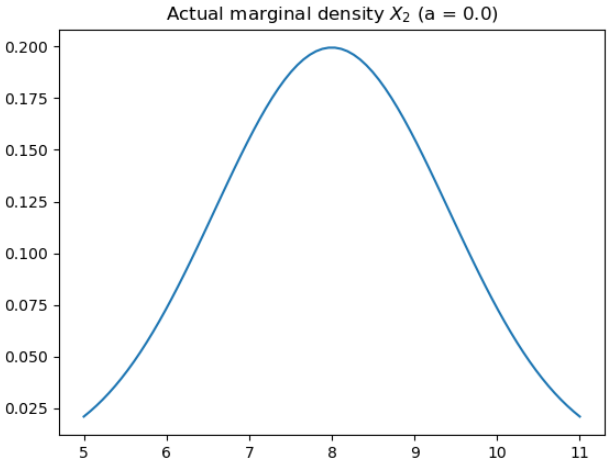


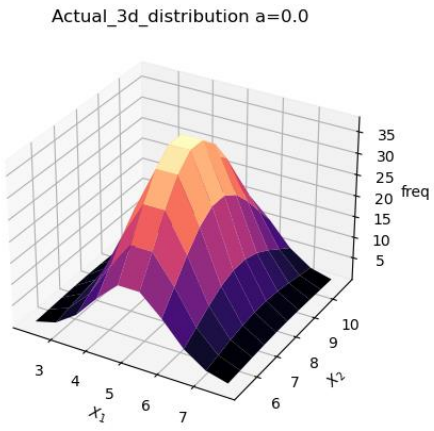
- When a=0.0, the following simulated/actual marginal and joint densities/distribution are shown below:

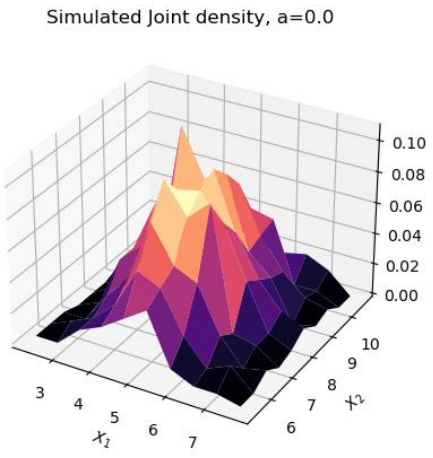












- When a=0.5, the following simulated/actual marginal and joint densities/distribution are shown below: