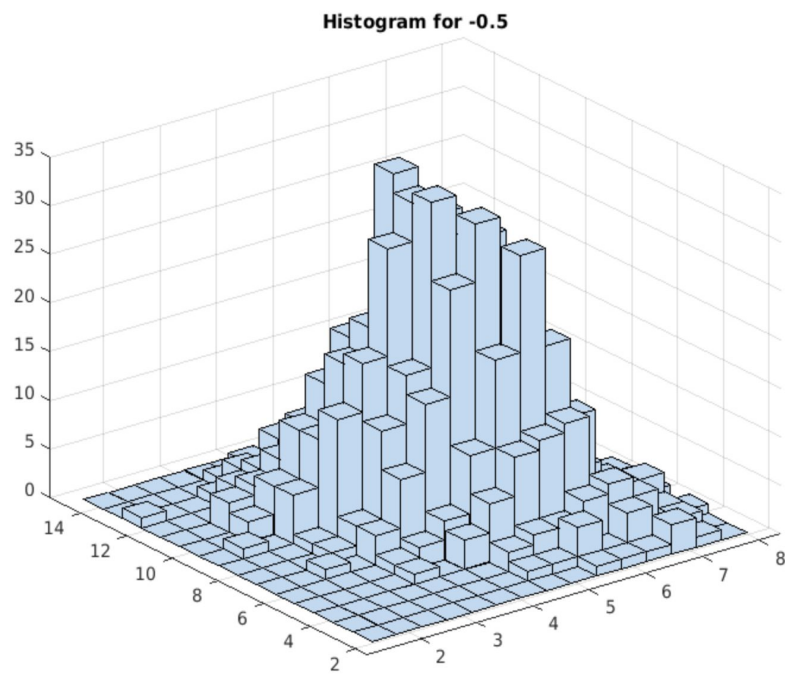


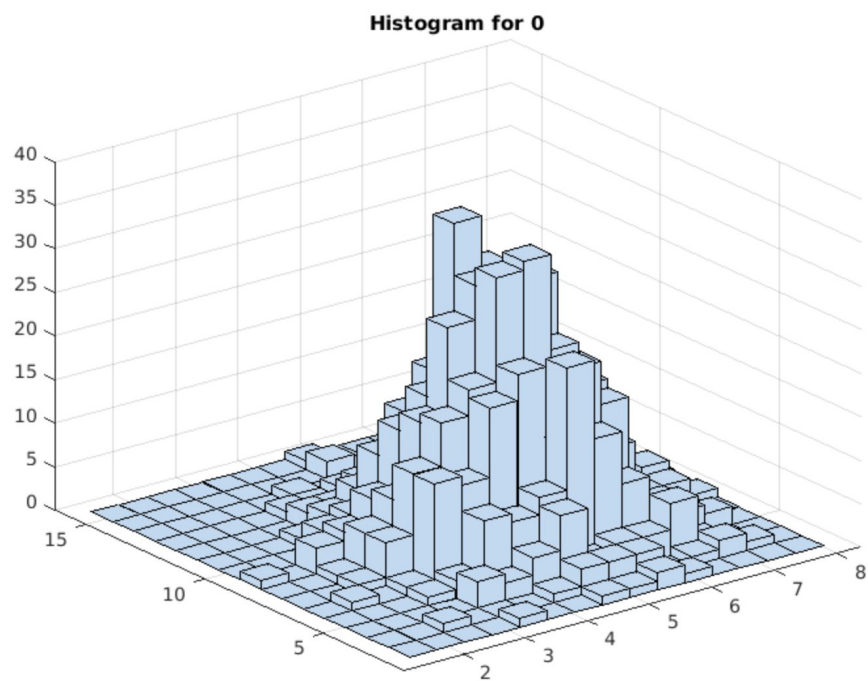
**Problem I** (Implicit Implementation)

**Problem II**

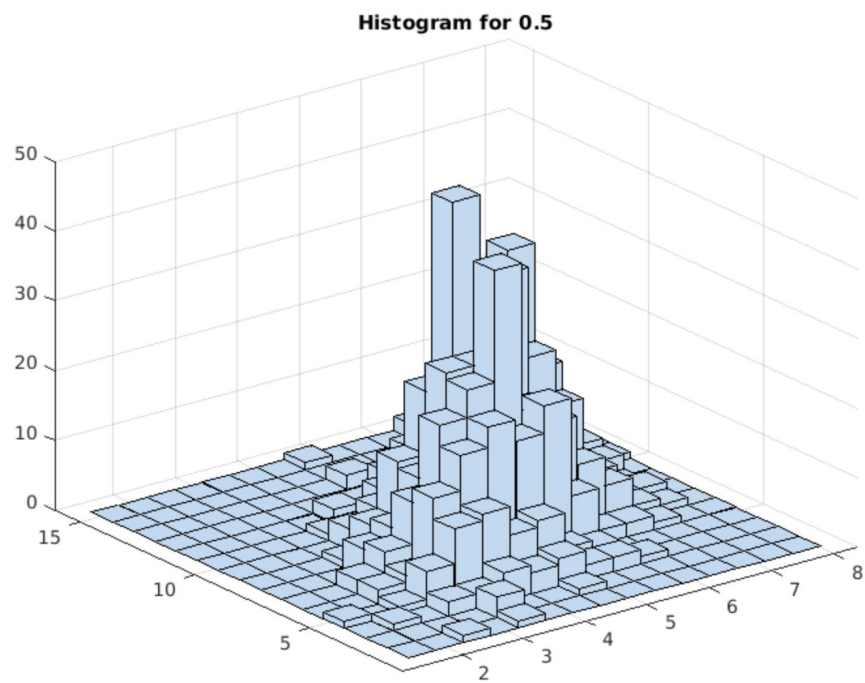
1. For  $a = -0.50$ :



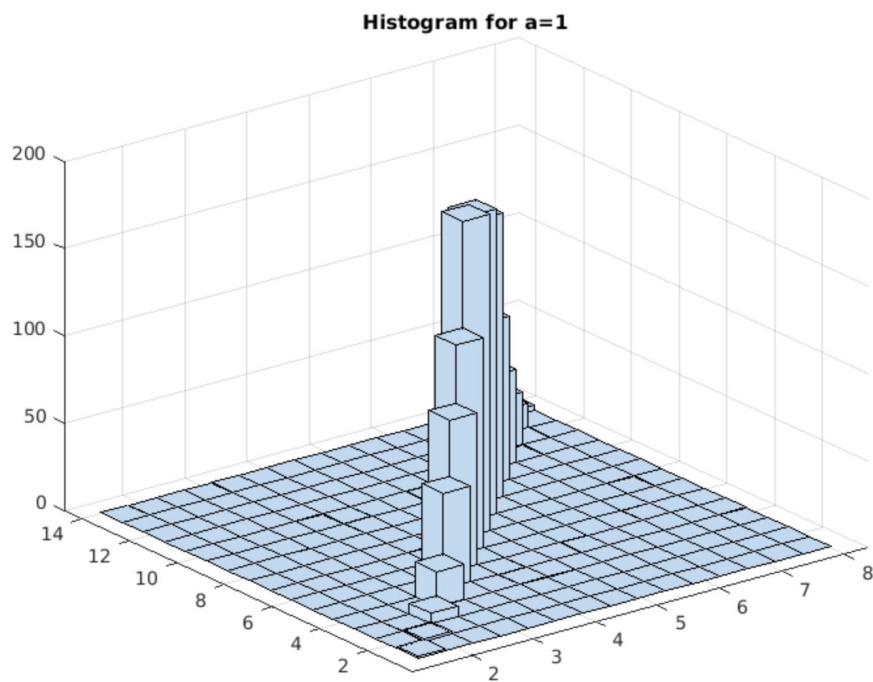
2. For  $a = 0$ :



3. For  $a = 0.50$ :



4. For  $a = 1$ :

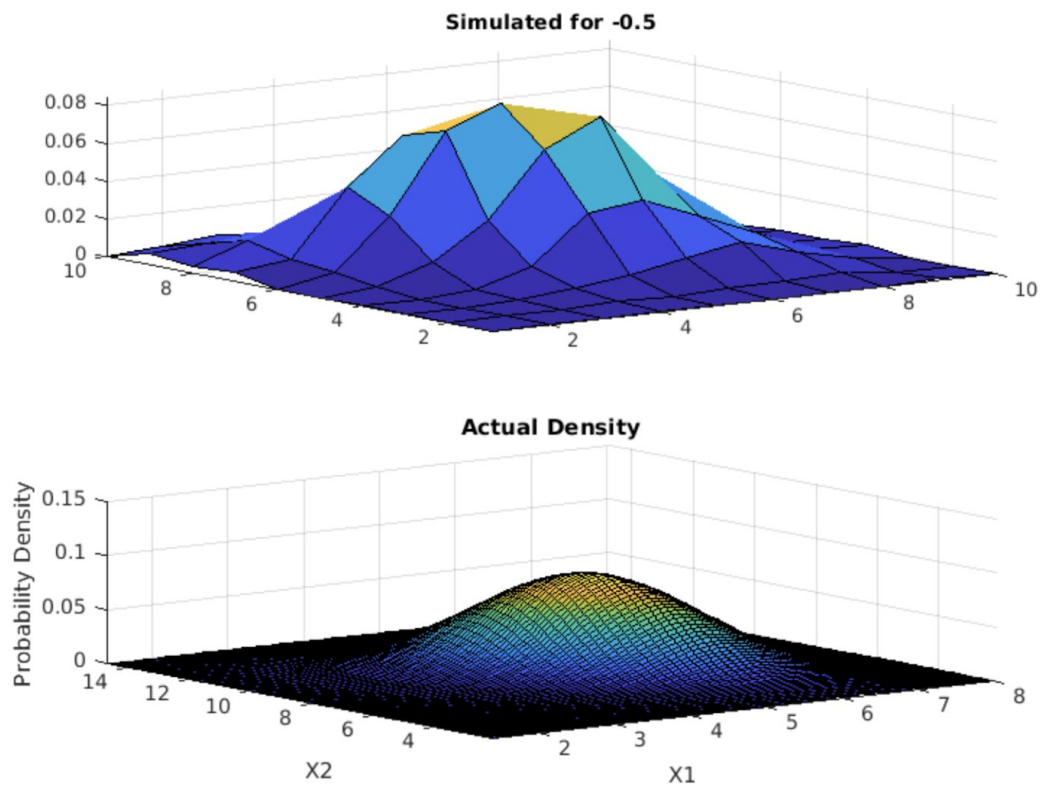


Since, for  $a = 1$ , the Sigma matrix is Singular (determinant is zero). Therefore the probability density function  $f(X, Y)$  does not exist. Hence, the difference.

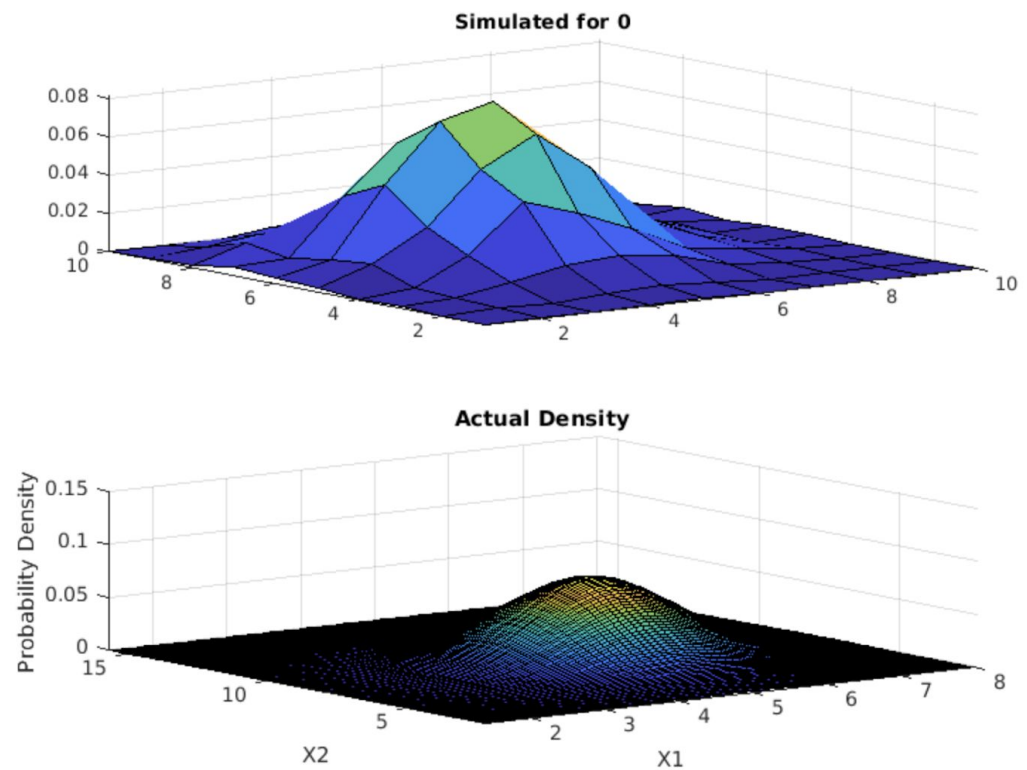
### Problem III

**Actual Densities** and **Simulated Densities Surface** plots are as following :

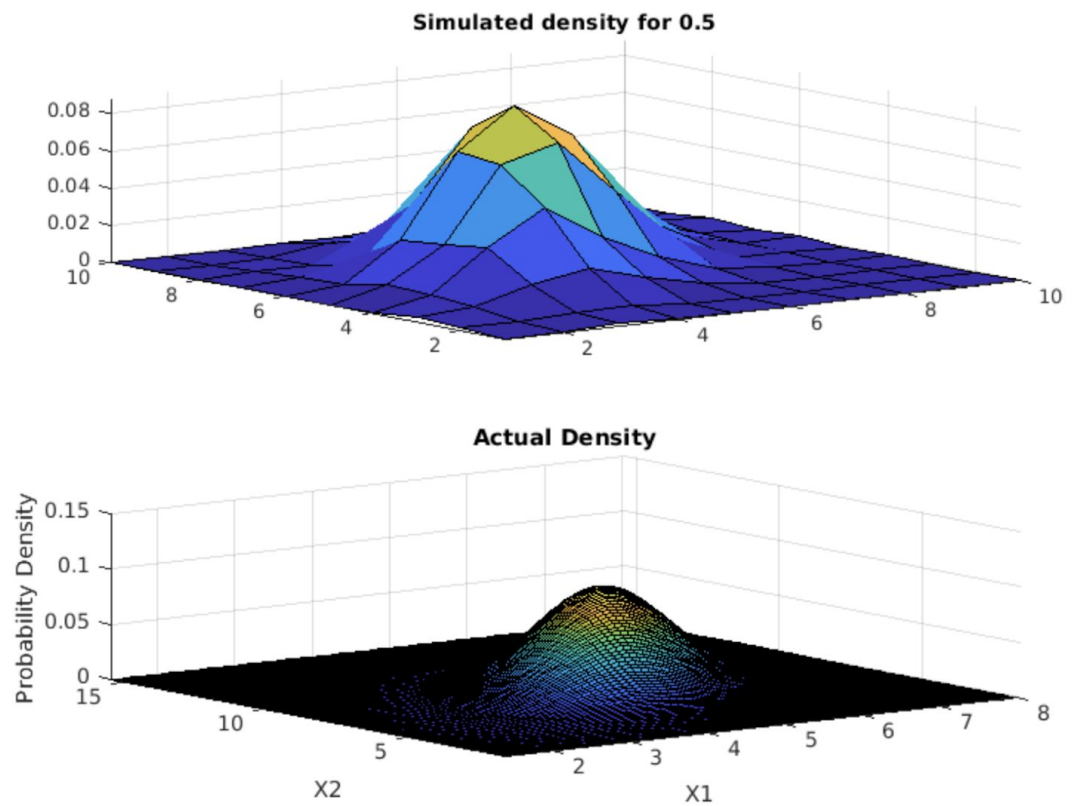
1. For  $a = -0.50$ :



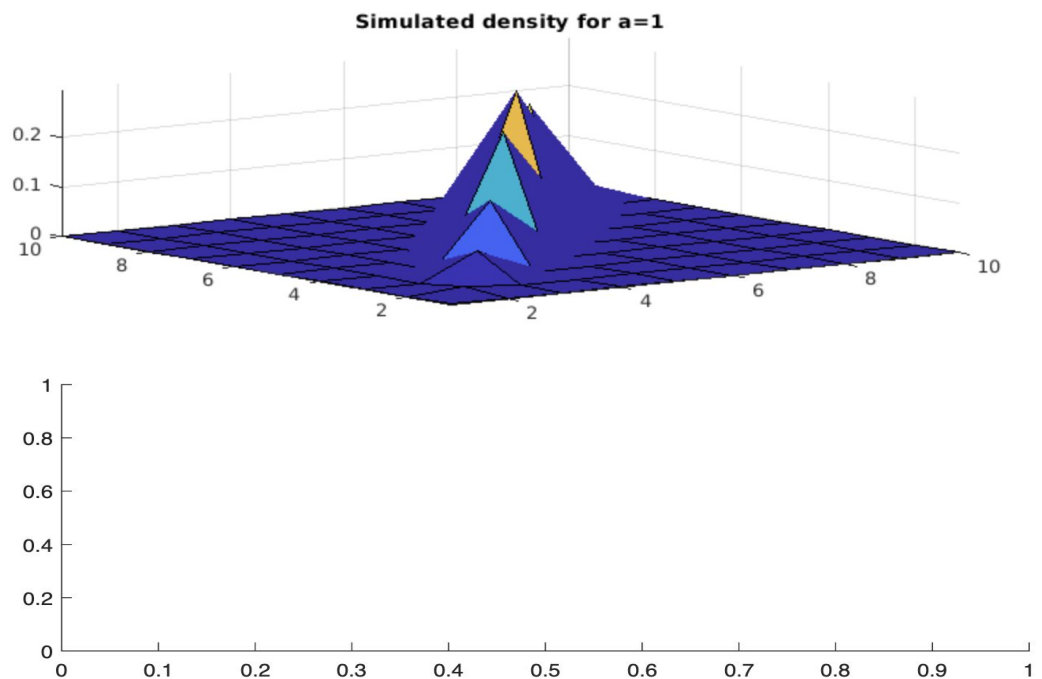
2. For  $a = 0$ :



3. For  $a = 0.50$ :



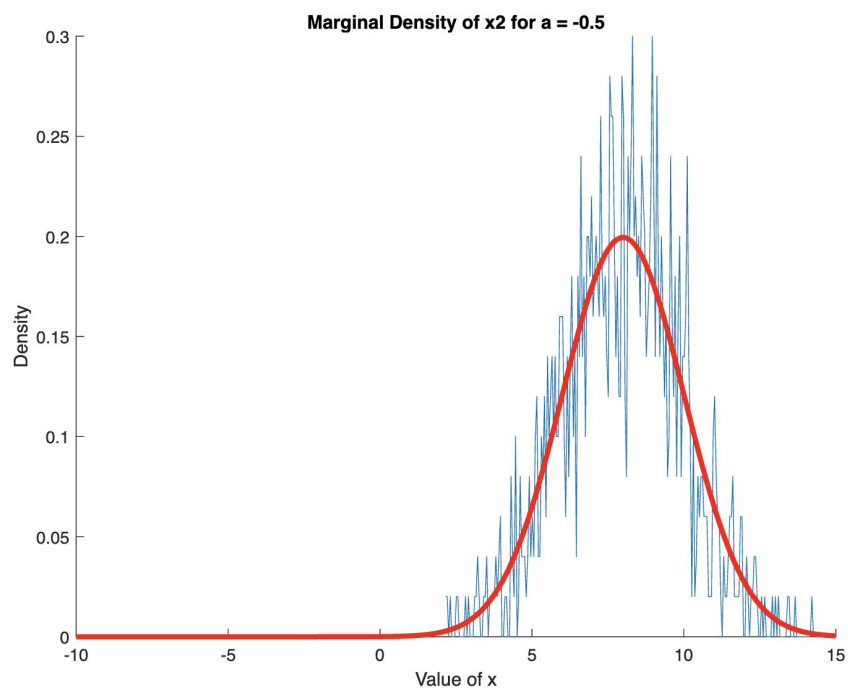
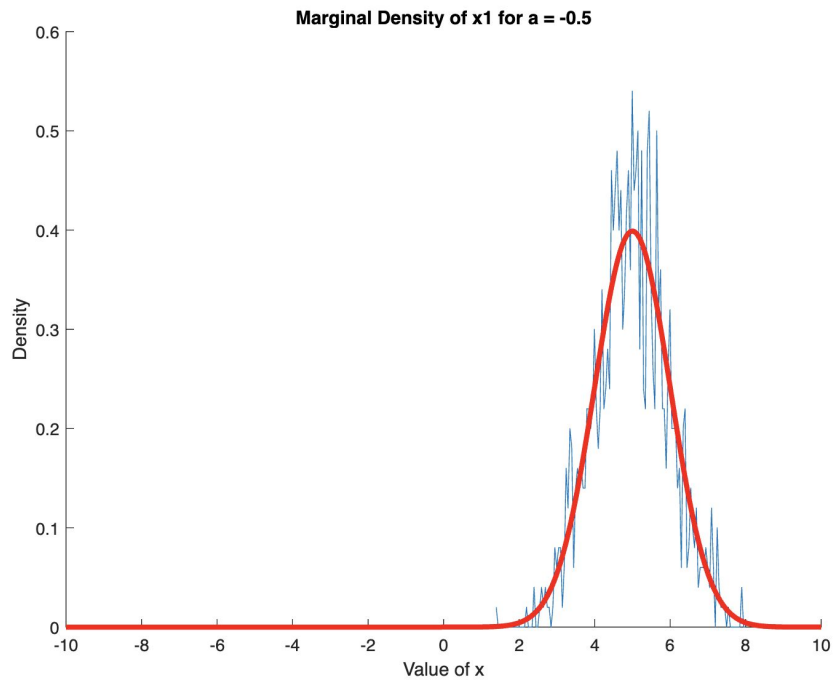
4. For  $a = 1$ :



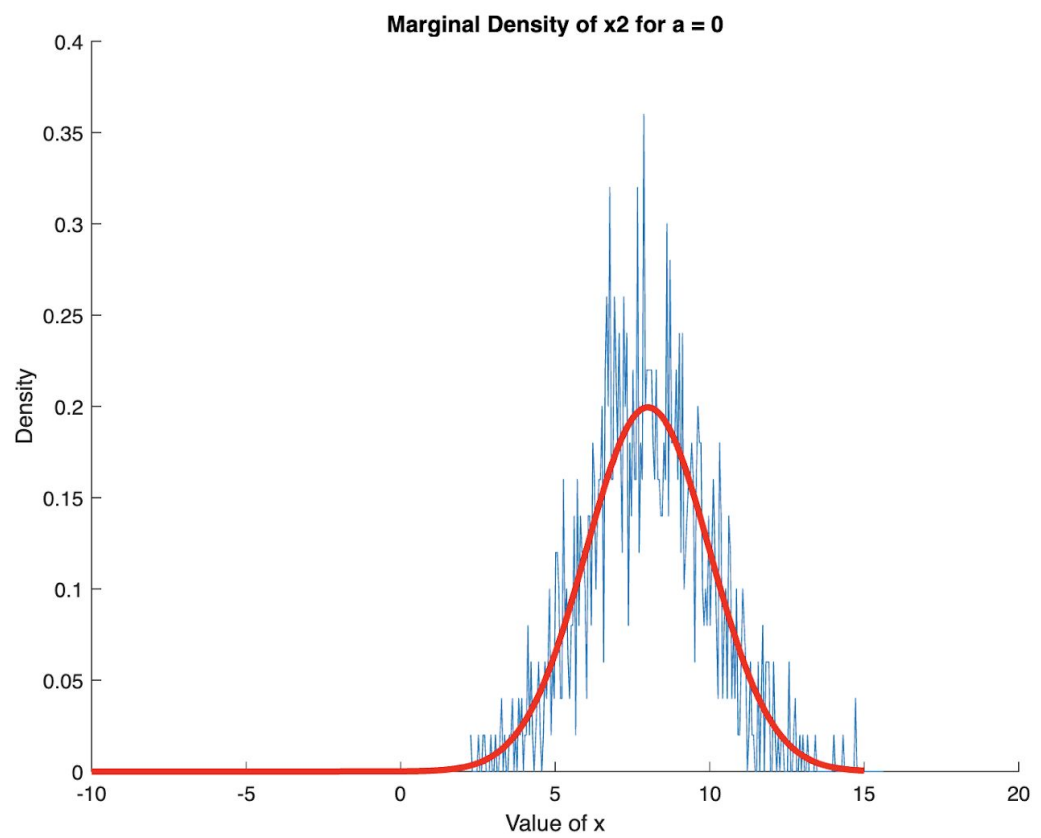
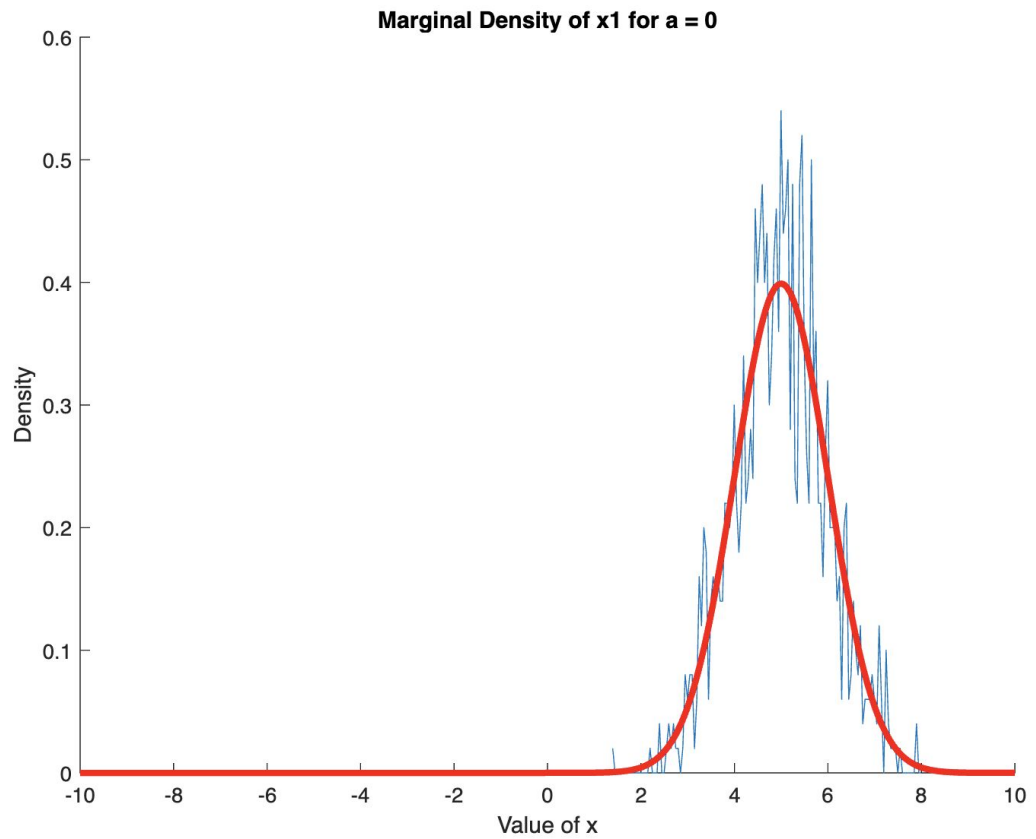
Since, for  $a = 1$ , the Sigma matrix is Singular (determinant is zero). Therefore the probability density function  $f(X, Y)$  does not exist. Hence, the difference.

**Actual Marginal Densities** and **Simulated Marginal Densities** are plotted as following :

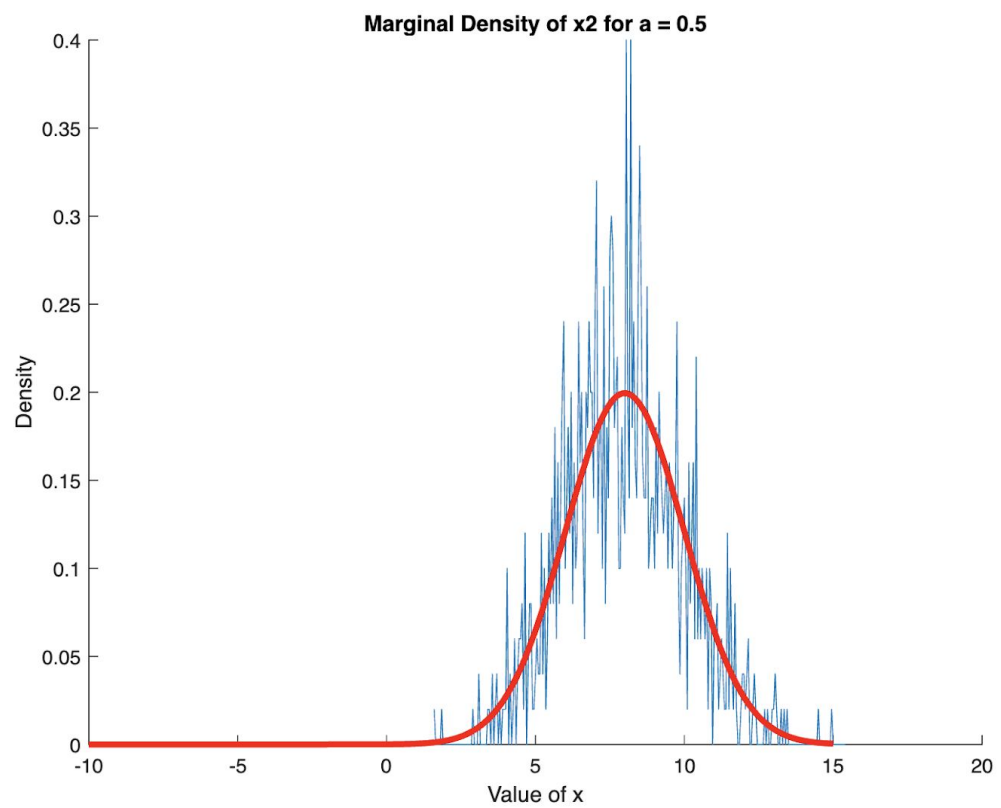
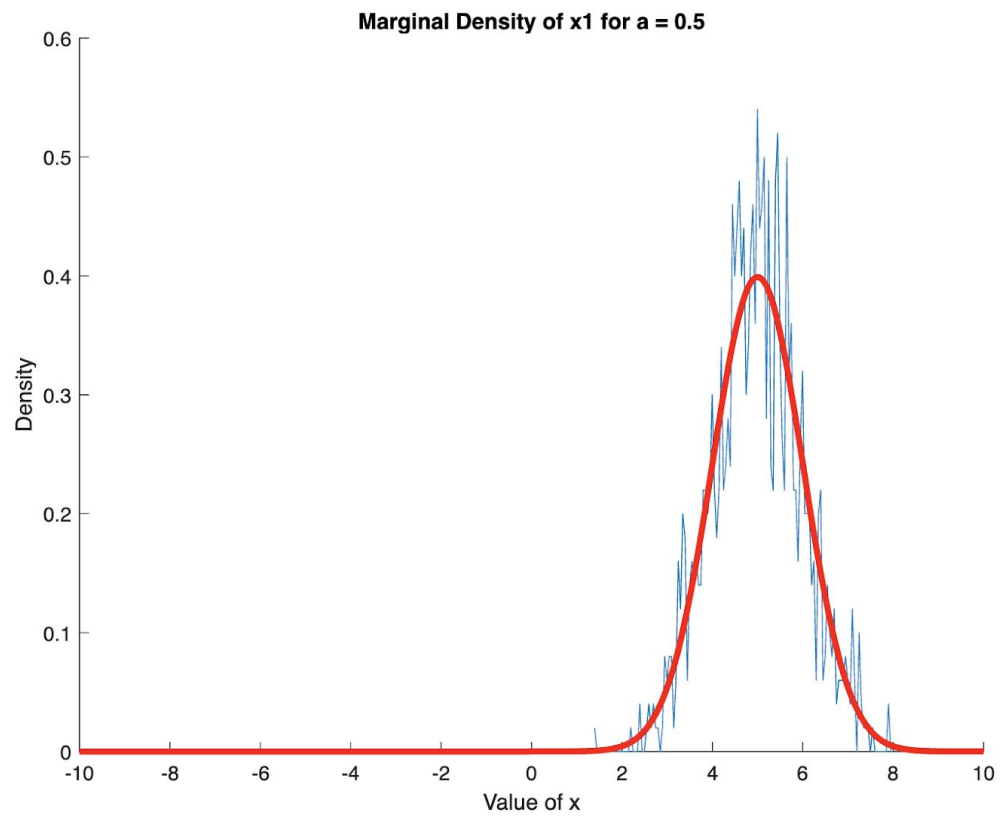
1. For  $a = -0.50$ :



2. For  $a = 0$ :



**3. For  $a = 0.50$ :**



4. For  $a = 1$ :

