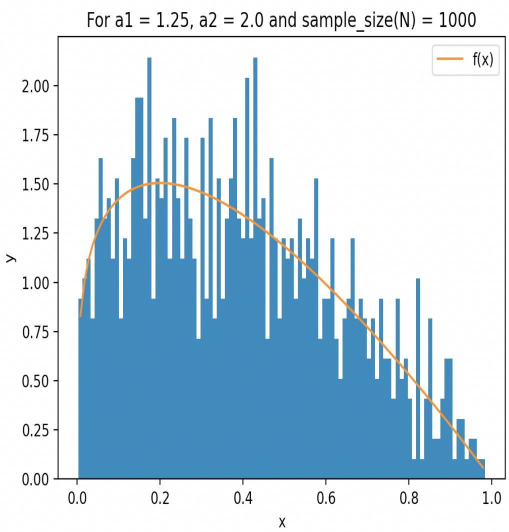
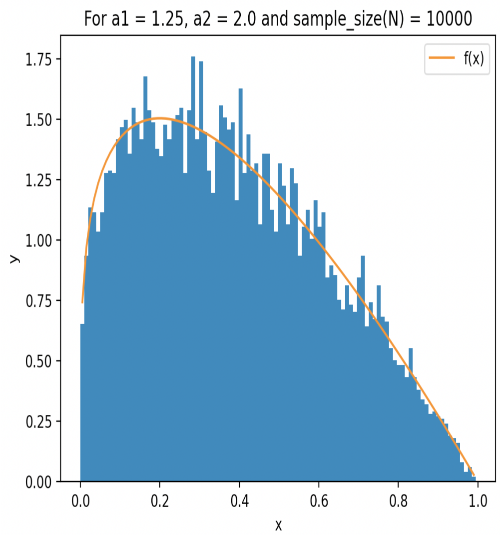
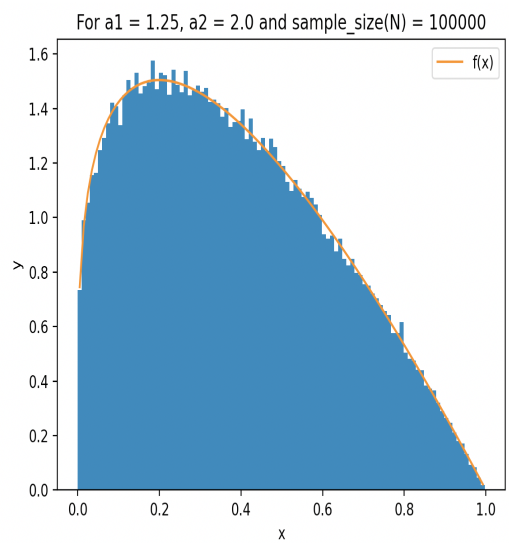
MA 323 (2020) Monte Carlo Simulation: LAB 04
Jay Vikas Sabale
180123019

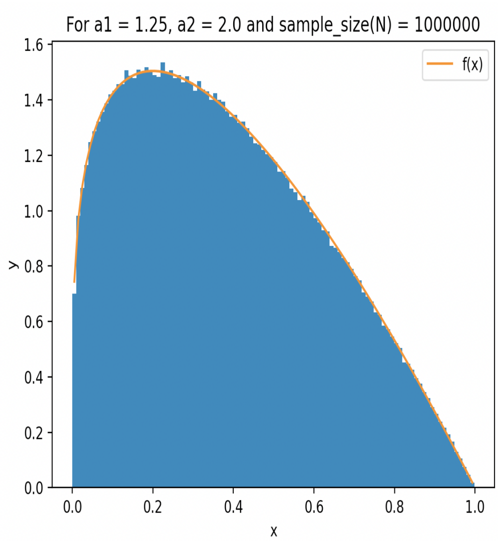
Problem

1. $Consider\ the\ values\ of\ \alpha_1 and\ \alpha_2\ as\ follows:$
   a. $\alpha_1 = 1.25,\ \alpha_2 = 2.0$
   b. $\alpha_1 = 1.25,\ \alpha_2 = 2.75$
   c. $\alpha_1 = 1.0,\ \alpha_2 = 2.0$
   d. $\alpha_1 = 3.25,\ \alpha_2 = 4.75$
   e. $\alpha_1 = 2.25,\ \alpha_2 = 1.75$
2. $Using\ *x = (\alpha_1 - 1)/(\alpha_1 + \alpha_2 - 2),\ we\ get:$
   a. $*x = 0.20$
   b. $*x = 0.125$
   c. $*x = 0.00$
   d. $*x = 0.375$
   e. $*x = 0.625$
3. $Using\ f(*x) = c,\ and\ f(x) \le c,\ we\ get:$
   a. $c = 1.5046656861969496$
   b. $c = 1.9372633177873984$
   c. $c = 2.0$
   d. $c = 2.2510765814672182$
   e. $c = 1.5344352515465707$
4. *Implicit Implementation*
5.
   a. $For\ \alpha_1 = 1.25,\ \alpha_2 = 2.0$

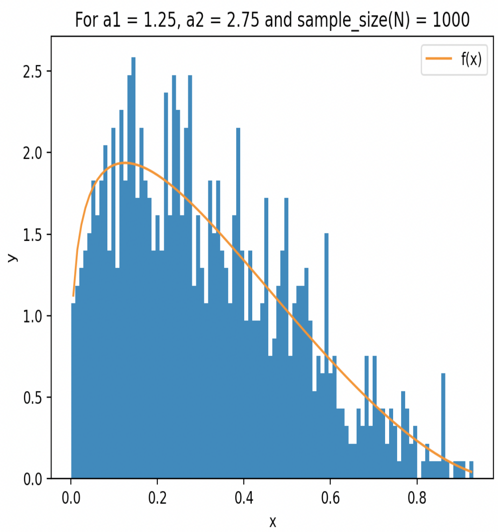


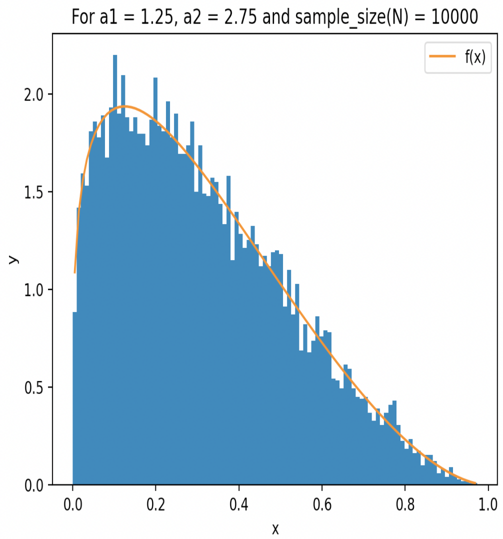


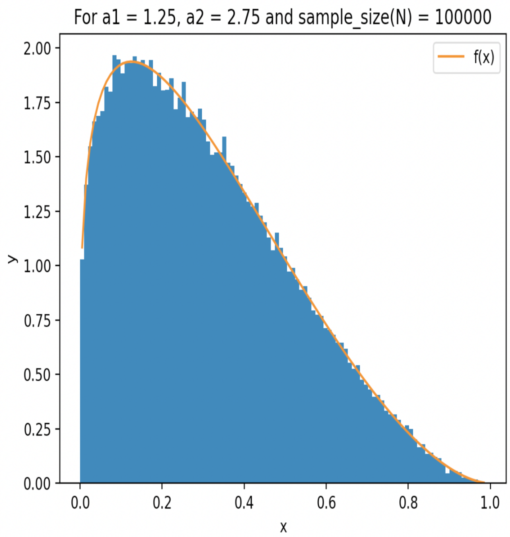


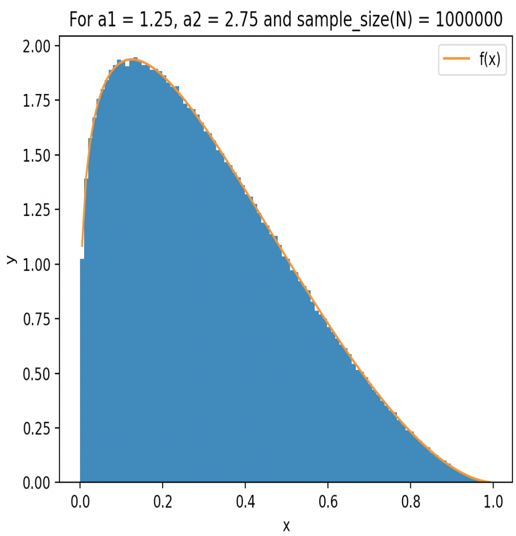


b. $For\ \alpha_1 = 1.25,\ \alpha_2 = 2.75$

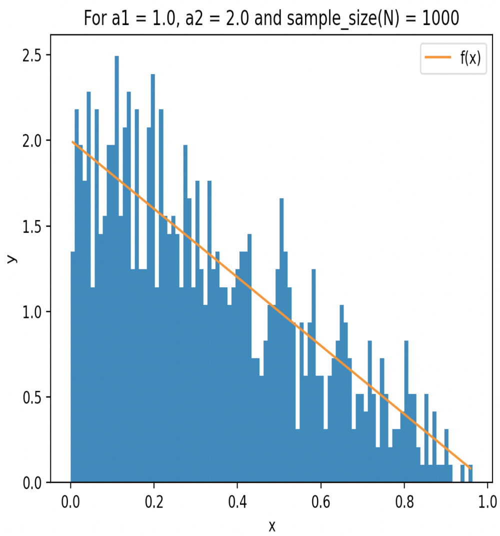


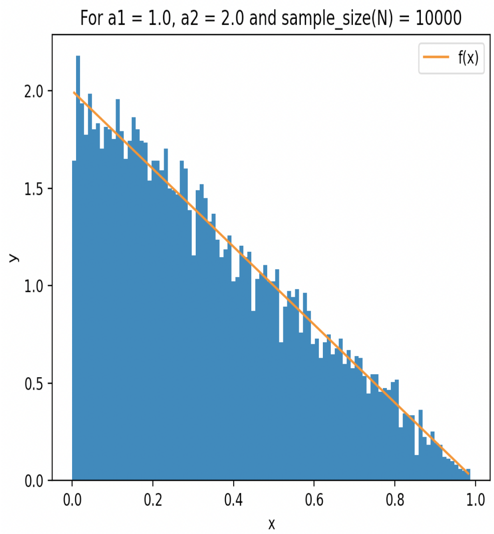


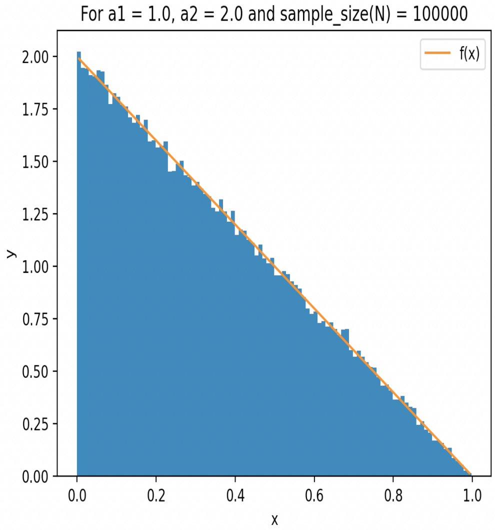


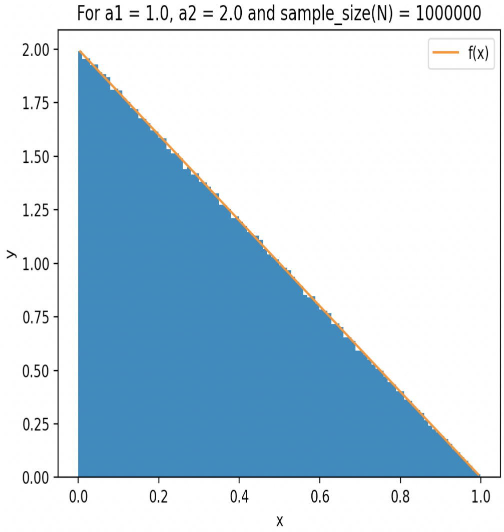


c. $For\ \alpha_1 = 1.0,\ \alpha_2 = 2.0$

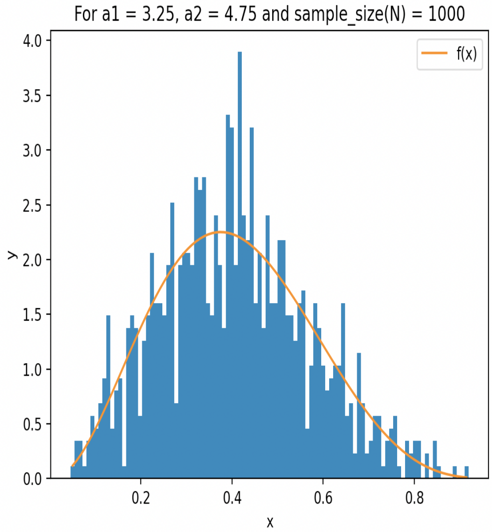


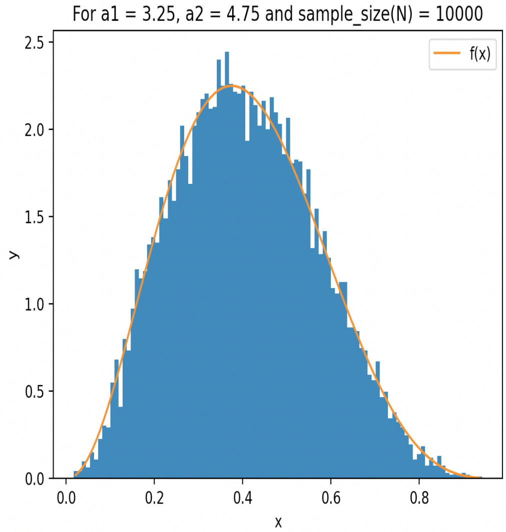


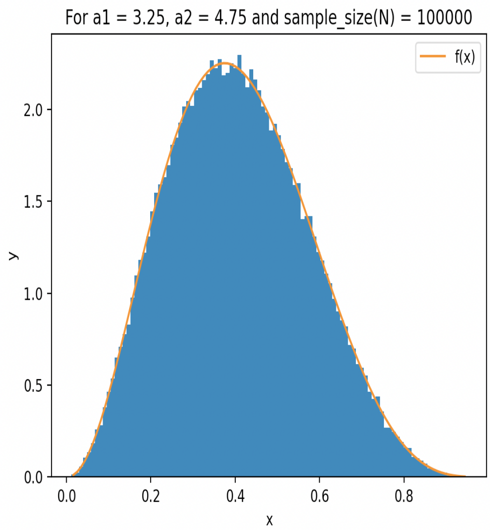


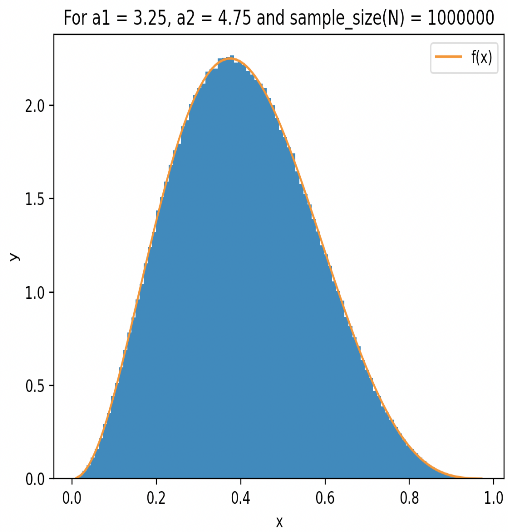


d. $For\ \alpha_1 = 3.25,\ \ \alpha_2 = 4.75$

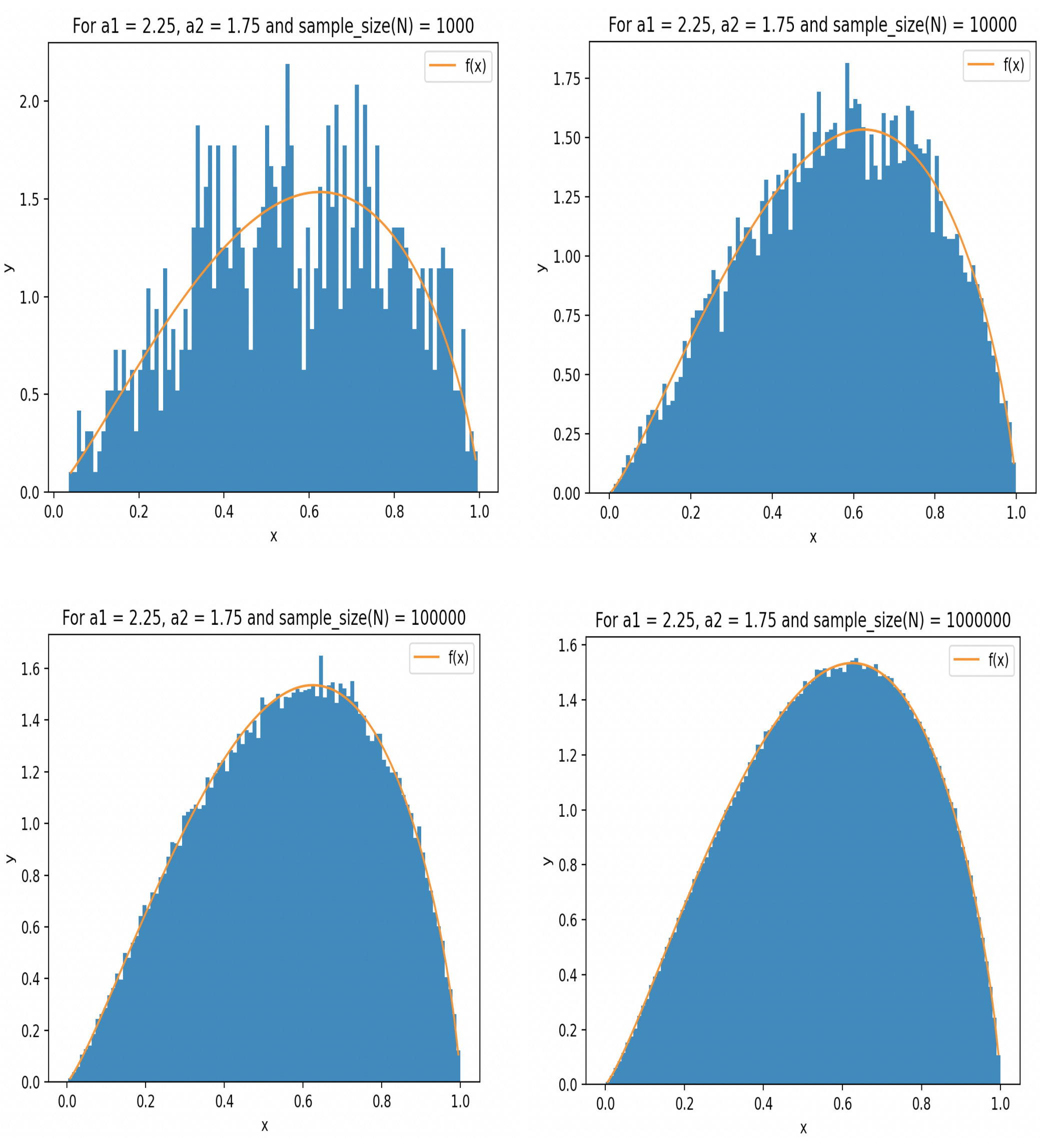








e. $For\ \alpha_1 = 2.25,\ \alpha_2 = 1.75$



Observations:

1. For all values of $\alpha_1 and\ \alpha_2$ chosen in part (1) of the problem, for large sample size, the sample beta distribution seems to coincide with actual beta distribution f(x).
2. The above histograms verify the claim made in (1) observation.