

1. Use the following Monte Carlo estimator to approximate the expected value $I = E[\exp(\sqrt{U})]$ where, $U \sim U(0, 1)$:

$$I_M = \frac{1}{M} \sum_{i=1}^M Y_i, \text{ where } Y_i = \exp(\sqrt{U_i}) \text{ with } U_i \sim U(0, 1).$$

Take the values of M to be $10^2, 10^3, 10^4$ and 10^5 . Determine the 95% confidence interval for I for all the four values of M that you have taken. What is the exact value of I ? Compare the exact value of I with the estimated values of I for different values of M .

Submission Deadline: September 08, 2022, 11:50 AM