ST2005: Applied Probability II
Lab Assignment 1

Q1. If $X_1$and X_2 are independent random samples from the Uniform distribution $U(0,1)$, by generating random samples find $P\left(|X_1 - X_2| < \frac{1}{4}\right)$.

Q2.

a. If $X_i s$ are independent random samples from the Beta distribution $\beta(1,1+\theta)$, by generating random samples for 3 different values for θ find

$$E\left[\frac{\sum_{j=6}^{10} ln(1-X_j)}{\sum_{i=1}^{10} ln(1-X_i)}\right]$$

and show that the result is independent from θ.

b. Using the distribution in Q1, show that the result is even independent from the distribution of $X_i s$.