Tutorial 4

October 12, 2019

1. Using two methods to calculate the integral:

   (a) $J_1 = \int_0^1 \frac{e^x - 1}{e - 1} \mathrm{d}x$;

   (b) $J_2 = \int_0^1 e^x \mathrm{d}x$;

   Requirement:

   (a) Use 'runif' to generate random numbers from $U(0, 1)$;

   (b) Set 'set.seed(1001)';

   (c) Report $n = 100, 500, 1000$;

2. An instrument simultaneously receives 50 independent signals. Each signal U_i is distributed as a uniform distribution $U(0, 10)$, $i = 1, 2, \cdots, 50$. Compute approximately the probability

$$P\left(\sum_{i=1}^{50} U_i > 300\right).$$

3. Suppose $X \sim Ga(n, 1)$. Determine n if

$$P\left(\left|\frac{X}{n} - 1\right| > 0.01\right) < 0.01.$$