The objective of this project is to estimate the mean and variance of random variables of various kinds. This project follows Project 3.1 of Chapter 3.

1. For each type of random variable described in Project 3.1 Step 1, calculate the theoretical mean and variance.
2. Generate the random sequences as specified in Project 3.1 Step 1.
3. Estimate the mean and the variance of these random variables using the following formulas:

$$E\{X\} \approx M_n = \frac{1}{n}\sum_{i=1}^{n} X_i \qquad Var[X] = \sum{}_n^2 = \frac{1}{n}\sum_{i=1}^{n}(X_i - M_n)^2$$

(These formulas are discussed in Chapter 6.)
4. Repeat Steps 2 and 3 by increasing the sequence length n to (a) 20,000, and (b) 40,000.
5. Compare the estimated values in each case with the corresponding theoretical values.