CSCI 410: Modeling and Simulation

Written Assignment 3

Due November 10th, 23:59:59PM.

- 1. The following data are drawn from a discrete distribution.
 - 1, 11, 3, 1, 2, 4, 2, 1, 1, 4
 - 1, 7, 2, 10, 4, 2, 2, 4, 1, 13
 - 2, 4, 4, 9, 1, 12, 7, 3, 9, 4
 - 1, 2, 3, 1, 3, 8, 16, 2, 5, 6
 - 4, 1, 1, 3, 13, 1, 5, 1, 7, 6
 - (1) Define an empirical distribution and plot it.
 - (2) Plot its histogram and calculate the summary statistics as shown in Section 6.4. Use the histogram and the statistics to hypothesize a distribution for the sample data.
- 2. The following data are drawn from a continuous distribution.
 - 2.0, 6.7, 5.7, 1.8, 2.0, 5.6, 3.3, 1.8, 1.9, 1.6,
 - 5.1, 4.8, 4.0, 6.3, 6.6, 8.0, 2.4, 1.0, 0.6, 1.5,
 - 7.0, 7.0, 1.4, 5.1, 1.6, 5.2, 7.0, 5.6, 5.3, 4.7,
 - 7.0, 4.1, 6.7, 9.7, 1.5, 3.7, 6.4, 1.7, 0.4, 2.1,
 - 5.7, 9.4, 8.9, 2.1, 4.1, 1.1, 3.8, 3.0, 2.5, 2.7

Group the number into 6 equal-width intervals.

- (1) Use the group data to define an empirical distribution and plot it.
- (2) Use the empirical distribution to calculate the probability of $x \le 5.0$.
- (3) Plot its histogram and calculate the summary statistics as shown in Section 6.4. Use the histogram and the statistics to hypothesize a distribution for the sample data.
- 3. Use a scatter diagram to verify the independence among the following samples.

3.0, 3.4, 2.7, 6.8, 7.6, 4.8, 2.2, 2.5, 0.6, 6.7, 7.8, 5.6, 7.2, 9.0, 6.1, 7.9, 8.6, 7.4, 6.5, 6.8, 6.0, 5.3, 5.6, 3.4, 3.0, 3.8, 2.6, 9.6, 10.3, 8.8, 2.4, 2.5, 1.1, 6.9, 8.6, 5.4, 2.9, 3.4, 2.3, 0.7, 1.3, -0.4, 5.5, 5.6, 4.5, 5.7, 7.2, 5.6, 6.8, 7.0, 6.8, 0.5, 0.9, -1.3