M. Mohammadian

Homework 1

Statistical Data Analysis

Presenting Data
Tables, Charts, Measures

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1) **Children.** The number of children in 50 households has been determined. (data: households)

   a. Form the absolute frequency and the relative frequency (percentage) distributions.
   b. Plot the pie chart.
   c. Plot the bar chart.
   d. Calculate the cumulative percentage distribution.
   e. Plot the empirical cumulative distribution function.

2) **Electricity Cost.** The Data displayed here represent the electricity cost during a certain month for a random sample of 50 households in a large city. (data: households)

   a. Form the frequency distribution and the percentage distribution.
   b. Form a frequency distribution that has five class intervals. (classes: 80 - 108 - 136 - 164 - 192 - 220)
   c. Calculate for (b) the cumulative percentage distribution.
   d. Plot the empirical cumulative distribution function.

3) **Blood Group.** The blood group data of 40 patients are reproduced in (data: blood)

   a. Form the frequency and the percentage distributions.
   b. Plot the pie chart.
   c. Plot the bar chart.

4) **Complaints.** One of the major measures of the quality of the service provided by any organization is the speed with which the organization responds to customer complaints. During the last year a company selling computers and electronic devices received 40 complaints concerning network installations. The following data represent the number of days between the receipt of the complaint and the resolution of the complaint. (data: complaints)

   a. Form the absolute frequency and the percentage distributions.
   b. Plot the bar chart and the pie chart.
   c. Calculate the cumulative percentage distribution.
   d. Plot the empirical cumulative distribution function.

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5) Service Life Time. The service life [years] time for 100 engines of a certain type is recorded. (data: life.time)

a. Form the absolute frequency and the relative frequency (percentage) distributions, plot the histogram
b. Calculate the cumulative percentage distribution.
c. Plot the empirical cumulative distribution function.

6. Invoice. The invoice amount for 100 customers has been recorded. (data: invoice)

a. Form the absolute frequency and the relative frequency (percentage) distributions, plot the histogram
b. Calculate the cumulative percentage distribution.
c. Plot the empirical cumulative distribution function.

7. Network. A network analyst has recorded the root cause of network crashes during the past six months.

Reason for failure	Frequency
Physical connection	1
Power failure	11
Server software	23
Server hardware	15
Server out of memory	35
Inadequate bandwidth	7

a. Form and plot a Pareto diagram.
b. Plot the pie diagram.

8) Measures. For problems 1, 2, 4, 5, and 6:
a. Compute the arithmetic mean, median, range, variance, standard deviation, coefficient of variation.
b. Find the 10^{th}, 25^{th}, 75^{th}, and 90^{th} percentile of the data sets.
c. Form the box-plots.