**Math 170S**
**Homework for Section 6.1** *†

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**Note:** Homework will not be collected, but the question for Quiz 2 might be picked from the homework questions.

1. Show that for any data samples $x_1, \ldots, x_n$

$$\sum_{i=1}^{n}(x_i - \overline{x}) = 0$$

   .

   Let $\tilde{x} := \sum_{i=1}^{n} x_i^2$. Represent $s^2$ in terms of $\overline{x}$ and $\tilde{x}$.

2. Suppose we have sample values

$$(x_1, x_2, \ldots, x_{10}) = (2, 4, 2, 5, 6, 1, 3, 3, 2, 6).$$

   Compute the corresponding sample mean, variance of the empirical distribution, sample variance, and sample standard deviation.

3. Solve Problem 6.1-2 from Hogg et al textbook.

4. Compute the sample mean and sample variance of the raw sample values given in Table 6.1-1 in the textbook. Also compute the sample mean and sample variance of the grouped data, using the class marks and with their respective frequencies. How do they compare?

5. Using table Va-b from Appendix B of the textbook, explain the percentages that appear in the Empirical Rule (68%, 95% and 99.7%, see page 229), in the case when your data is well approximated by the Normal distribution $N(0, 1)$.

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