Assignment 2

1. A random sample of n observations, $X_1, X_2, \cdots, X_n$, is taken from a population with mean μ. Let $\overline{X}$ denote the sample mean.

(a) Show that $\sum_{i=1}^{n}(X_i - \overline{X}) = 0$

2. A new toy has been introduced into the retail outlets of a large chain of toy stores. A random sample of twelve outlets showed the following results for numbers sold in the first week. [Assume the population distribution is normal.]

113 102 87 69 111 93 84 98 108 89 96 85

(a) Find the sample mean.
(b) Find the sample variance.
(c) Find the sample standard deviation.
(d) Test at the 5% level the null hypothesis that the population mean is at least 100.
(e) Test at the 5% level the null hypothesis that the population standard deviation is at most 10.

3. The following linear regression model was estimated through least squares for a sample of 79 quarterly observations:

$$\widehat{Y} = 0.00027 + 0.792X$$
$$(0.276)$$

where the figure in parentheses below parameter estimate is the corresponding estimated standard error, and

Y= actual change in Canadian treasury bill spot rate
X= change in spot rate predicted by the forward rate

(a) Interpret the estimate slope of the regression line.
(b) Test at the 5% level the null hypothesis that the slope of the population regression line is zero against the alternative that the true slope is positive.
(c) Test at the 5% level against a two-sided alternative the null hypothesis that the slope of the population regression line is one.

4. Page 68 on the textbook, question #6 (download data from the textbook web site).