Exercise 101. Air pollution is determined by measuring several different elements that can be detected in the air. One of them is carbon monoxide. The following sample of daily readings was obtained from a local newspaper:

$$3.5 \quad 3.9 \quad 2.8 \quad 3.1 \quad 3.1 \quad 3.4 \quad 4.8 \quad 3.2 \quad 2.5 \quad 3.5 \quad 4.4 \quad 3.1$$

a. Compute the mean and the standard deviation of the sample.

b. Carbon monoxide is measured and interpreted according to the accompanying scale. Does the sample show sufficient evidence to allow us to conclude that the carbon level monoxide is low, that is, $\mu < 4.9$ at $\alpha = 0.05$?

c. Does the sample show sufficient evidence to allow us to reject the claim that the variance in the carbon monoxide readings is no more than 0.25 at $\alpha = 0.05$?

d. Construct the 90%, 95% and 99% confidence intervals for estimating the mean daily level of carbon monoxide pollution.

e. Construct the 90%, 95% and 99% confidence intervals for estimating the standard deviation of carbon monoxide pollution.

Exercise 96. A student group claims that the average student must travel for at least 25 minutes in order to reach the college every day. The college admissions office obtained a random sample of 36 one-way travel times from students. The sample had a mean of 19.4 minutes and a standard deviation of 9.6 minutes. Does the admissions office have sufficient evidence to reject the students' claim? Use $\alpha = 0.01$.

Exercise 97. Ten randomly selected shut-ins were each asked to list how many hours of television they watched per week. The results are:

$$82 \quad 66 \quad 90 \quad 84 \quad 75 \quad 88 \quad 80 \quad 94 \quad 110 \quad 91$$

Determine the 90% confidence interval estimate for the mean number of hours of television watched per week by shut-ins.

Exercise 98. It is claimed that students at a certain university will score an average of 35 on a given test. Is the claim reasonable if a random sample of test scores from the university yields:

$$33 \quad 42 \quad 38 \quad 37 \quad 30 \quad 42$$

Complete the hypothesis test using $\alpha = 0.05$.

Exercise 108. The tax rate is chosen such that it affects the unemployment level. The following table shows the tax rate vs. the unemployment level for a time frame of 10 months.

x	12,27	12,34	12,31	15,81	15,67	17,75	11,56	15,71	19,91	19,99	21,11
y	5,9	5,6	5,9	5,9	6,2	7,6	7,5	7,3	7,6	7,2	8,3

1. Determine the scatter diagram and the correlation coefficient of the sample.
2. Does this sample show sufficient evidence for the positive linear correlation of the tax rates and unemployment levels in general ?
3. Find the equation of the regression line.
4. Does the slope b_1 of the regression line show sufficient evidence to claim that $\beta_1 > 0$ at a significance level $\alpha = 0.05$?

Handwritten annotations:

$n = 36$

$\bar{X} = 19.4$

$s = 9.6$

$\alpha = 0.01$

$H_0 : \mu = 25$

$H_a : \mu < 25$

$\beta_1 \neq 0$