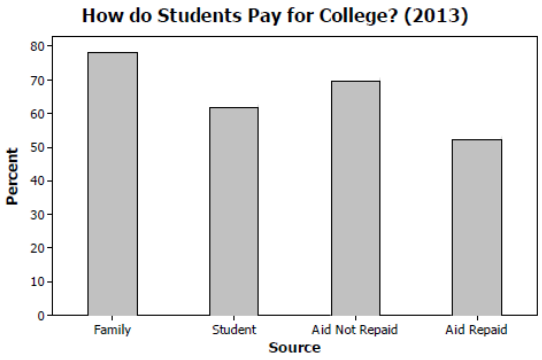
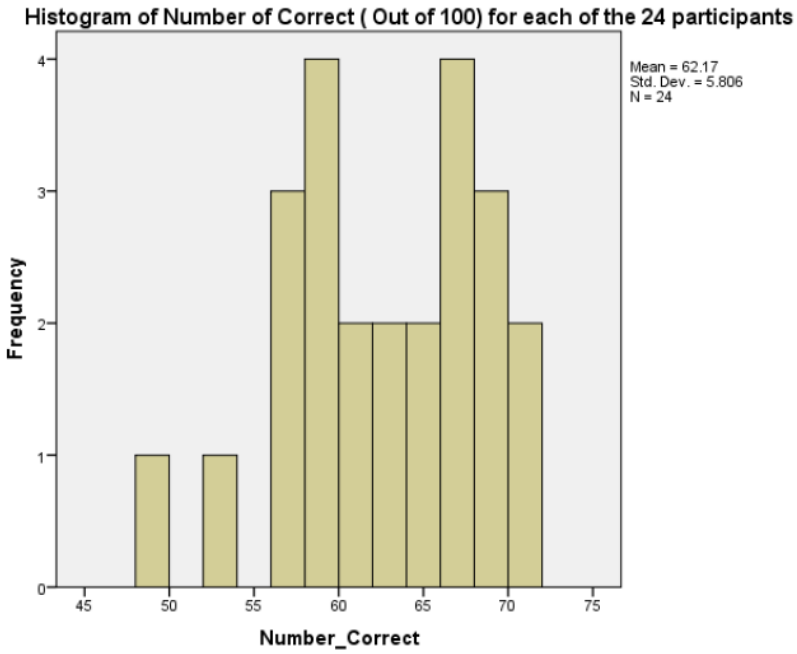
Assignment # 1 Solutions

1.4 (a) Individuals fall into more than one of the categories. **(b)** A bar graph is shown at right.



1.42 (a)



(b) The center of this distribution is around 62 correct identifications; the data vary from 49 to 70. The distribution is somewhat left-skewed, with no outliers.
(c) It would appear that a person's voice does help identify the taller person. If subjects were just guessing, we would expect the distribution to center at about 50, but the center here is much higher. In fact, only one person correctly identified the taller person less than 50 times, and that we 49 correct.

2.10 (a) $\bar{x}$ = (6.2 + 12.8 + 7.6 + 15.4)/4 = 42/4 = 10.5 picocuries. **(b)** The standard deviation can be computed in steps:

x	6.2	12.8	7.6	15.4	Sum
$x - \bar{x}$	−4.3	2.3	−2.9	4.9	0
$(x - \bar{x})^2$	18.49	5.29	8.41	24.01	56.2

$$s^2 = \frac{1}{n-1}\sum(x-\bar{x})^2 = \frac{1}{4-1}(56.2) = 18.7333.$$

So, $s = \sqrt{s^2} = \sqrt{18.7333} = 4.33$ picocuries.

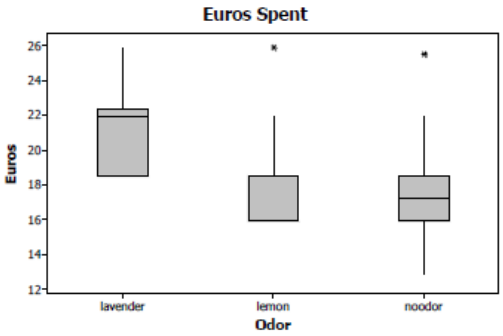
c)

Statistics

x

N	Valid	4
	Missing	0
Mean		10.5000
Std. Deviation		4.32820

2.46 STATE: Does the presence of a lavender or lemon odor in a pizza restaurant lead customers to spend more? PLAN: We'll compare side-by-side boxplots for the distributions of the amount spent (in Euros), as well as compute appropriate summary statistics. SOLVE: Boxplots are given. The summary statistics are given in the table.



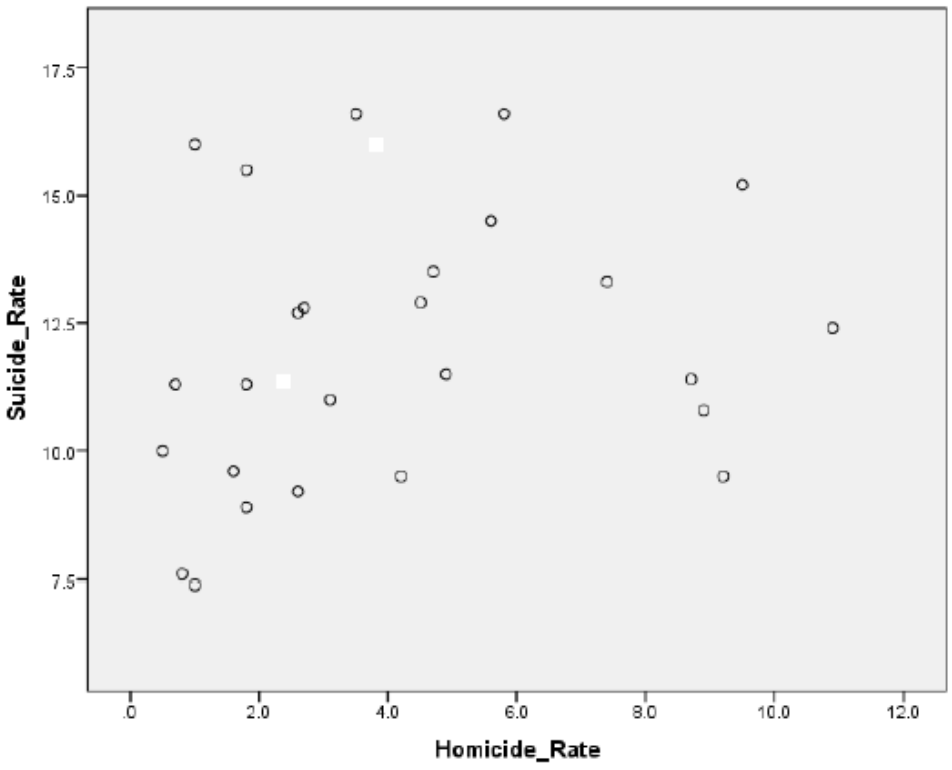
	Mean	StDev	Minimum	Q_1	Median	Q_3	Maximum
Lavender	21.123	2.345	18.5	18.5	21.9	22.35	25.9
Lemon	18.157	2.218	15.9	15.9	18.5	18.5	25.9
No odor	17.513	2.359	12.9	15.9	17.2	18.5	25.9

CONCLUDE: All three distributions are right-skewed. We note that the minimum and Q_1 are equal for both the lavender and lemon odors. With the lemon odor, the median is equal to Q_3. Both the lemon and the control (no odor) have high outliers. Because of the shapes, using the five-number summary to describe these distributions is more appropriate than the mean and standard deviation. Lavender seems to produce the highest customer expenditures; its median is 21.9 euros, which is above Q_3 (18.5 euros) for both of the other conditions.

2.51 (a) Min = 1.3, Q1 = 4.1, Median = 6.2, Q_3 = 13.4, Max = 27.1. (b) High-end outliers will be values larger than 13.4 + 1.5 × (13.4 – 4.1) = 27.35. California, at 27.1% foreign-born, is not an outlier.

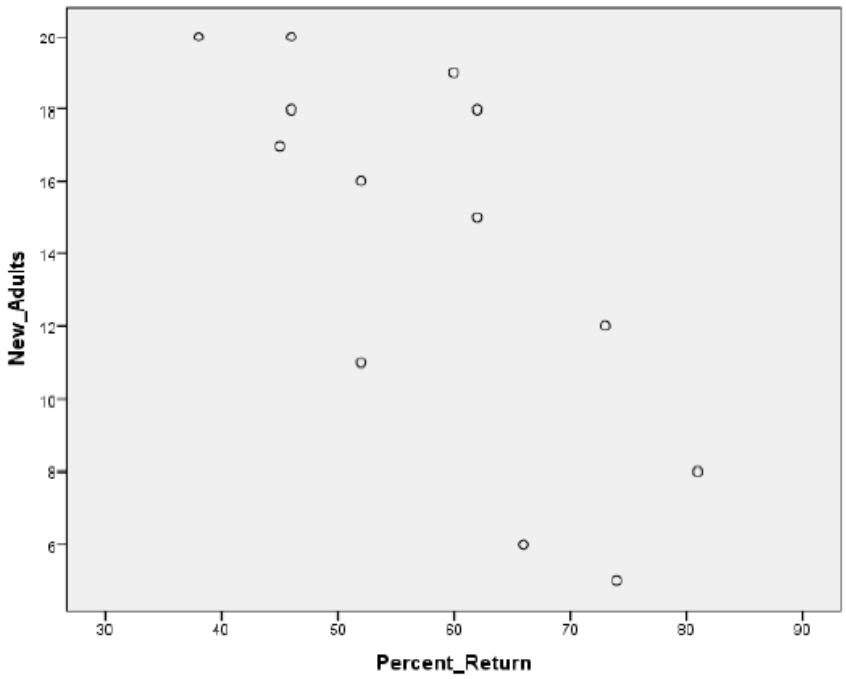
4.4

Because we only want to look for an association, either variable can be placed on the x-axis.



4.28

a) The scatter plot shows a negative, somewhat linear relationship. Correlation is an appropriate measure of strength: r= - 0.748.



b) Because this association is negative, we conclude that the sparrowhawk is a long-lived territorial species.