Homework 1

Questions 2.5 and 2.6

Below is a dotplot, histogram and frequency table of the activity of monoamine oxidase (MAO) in the blood platelets of 18 patients tested during a schizophrenia study. The data seem to be unimodal and right skewed.

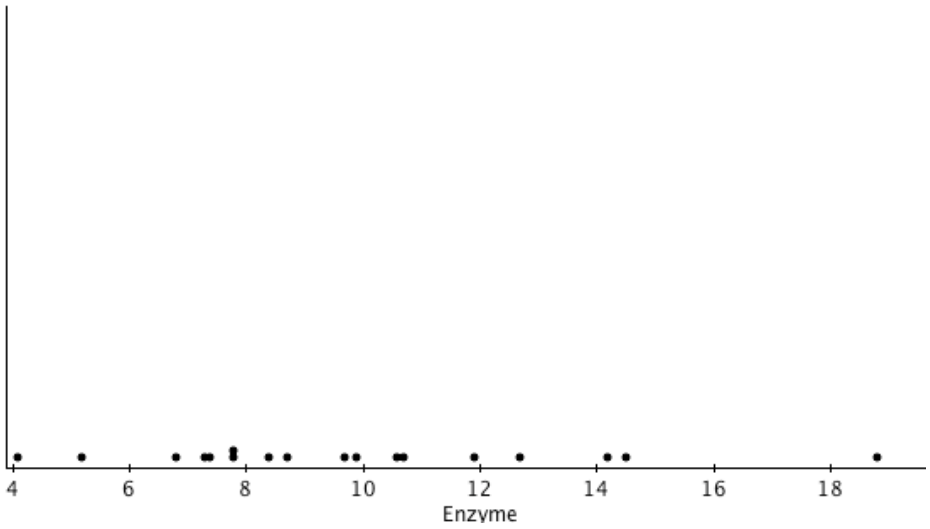

Figure 1:

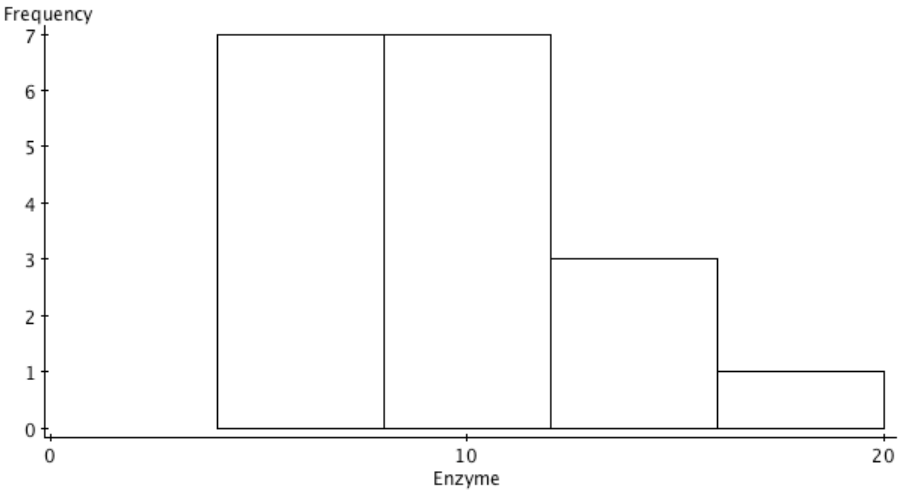

Figure 2:

Frequency table results for Bin(Enzyme):

Bin(Enzyme)	Frequency	Relative Frequency
4 to 6	2	0.11111111
6 to 8	5	0.2777778
8 to 10	4	0.22222222
10 to 12	3	0.16666667
12 to 14	1	0.055555556
14 to 16	2	0.11111111
18 to 20	1	0.055555556

Figure 3:

Question 2.25

For each of 36 sows, the number of piglets surviving 21 days was recorded. The mean litter size is calculated below:

$$\Sigma y_i = 5(1) + 6(0) + \ldots + 13(3) + 14(2) = 375$$
$$\bar{y} = \frac{\Sigma y_i}{n} = \frac{375}{36} = 10.41667$$

Question 2.45

Ten patients with high blood pressure participated in a study to evaluate the effectiveness of the drug Timolol. The mean change in blood pressure is calculated below:

$$\Sigma y_i = (-13) + (-29) + \ldots + (-13) + (-30) = -124$$
$$\bar{y} = \frac{\Sigma y_i}{n} = \frac{-124}{10} = -12.4$$

The standard deviation is calculated below:

$$s = \sqrt{\frac{\Sigma (y_i - \bar{y})^2}{n-1}} = \sqrt{\frac{2784.4}{10-1}} = 17.5814$$

Question 2.64

To calibrate a standard curve for assaying protein concentrations, a plant pathologist used a spectrotometer to measure the absorbance of light. Results are shown on the following page. The histogram is symmetric and unimodal.

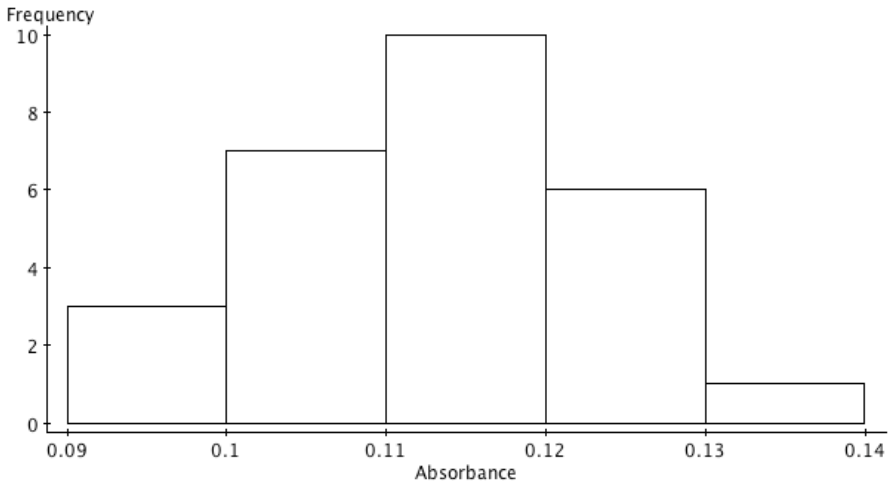

Figure 4:

Frequency table results for Bin(Absorbance):

Bin(Absorbance)	Frequency	Relative Frequency
0.09 to 0.1	3	0.11111111
0.1 to 0.11	7	0.25925925
0.11 to 0.12	10	0.37037036
0.12 to 0.13	6	0.22222222
0.13 to 0.14	1	0.037037037

Figure 5:

Question 2.73

A geneticist counted the number of bristles on a certain region of the abdomen of the fruitfly Drosophila melanogaster. The first, second, and third quartiles are shown below.

1.*quartile*	*median*	3.*quartile*
36	38	41

A boxplot of the data is shown on the following page. Results seem somewhat symmetric.

Using the sorted list of values (constructed in parts (a) and (b) to find the quartiles), we can count the number of observations falling in the interval (38.45 - 3.20, 38.45 + 3.20). This is 66.4%. It is interesting to note that under the 68, 95, 99.7 rule, one would expect 68 % of the data to fall within 1 standard deviation of the mean. This is very close to what we see in this example. This perhaps suggests our data are normal.

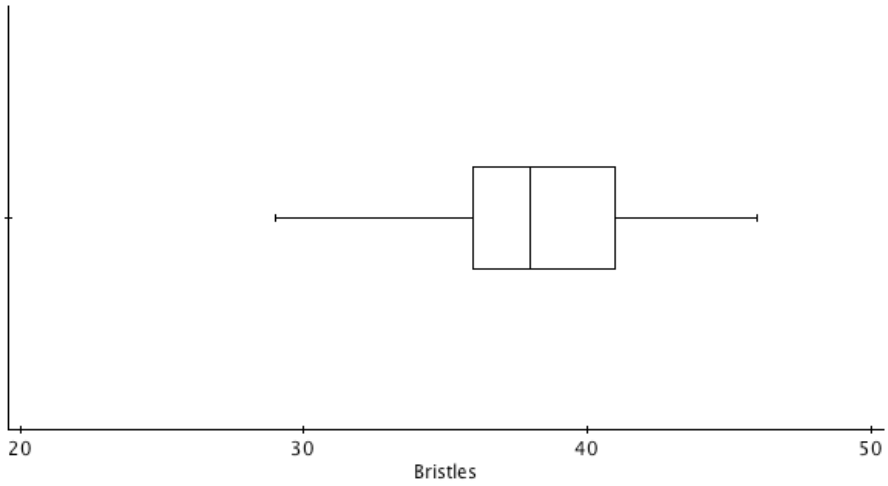

Figure 6: