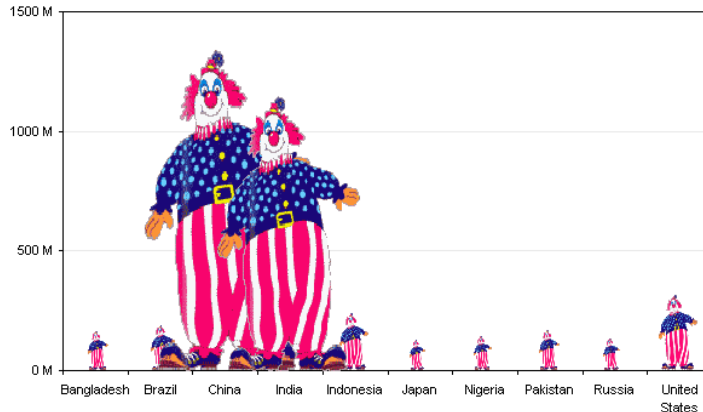
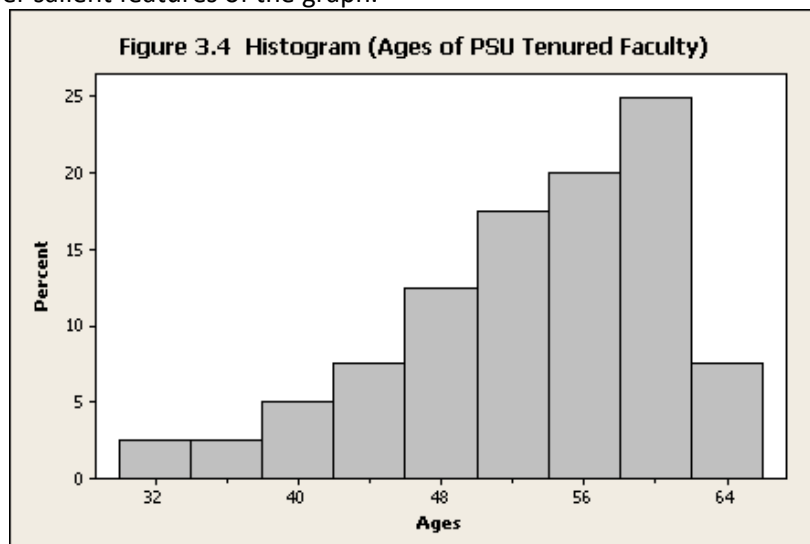


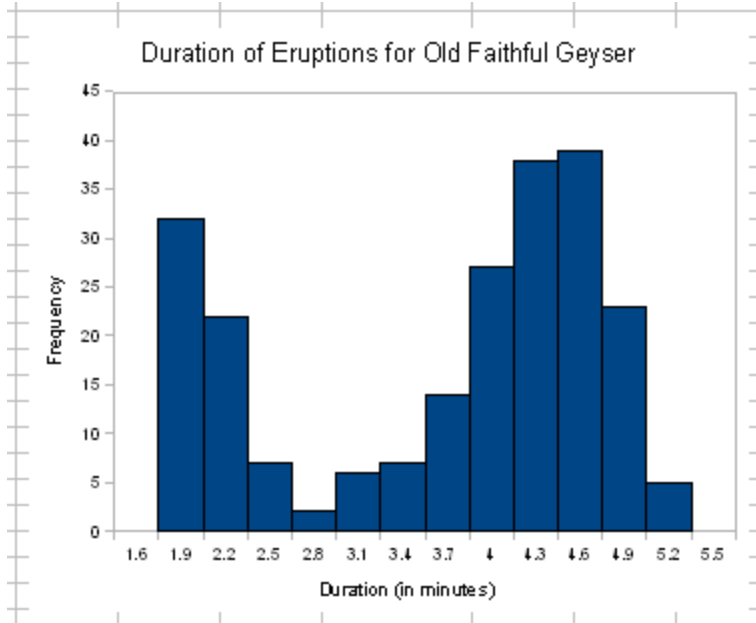
Instructions: Work problems on a separate sheet of paper and attach work to this page. You should show all work to receive full credit for problems. Questions with compact answers can be recorded directly on this page. Graphs and longer answers that won't fit here, indicate which page of the work the answer can be found on and be sure to clearly indicate it on the attached pages. You may use Excel to complete the problems, but then submit Excel files online.

- Below is an example of a bad graph. Explain, using scaling, why pictograms are generally a bad idea for accurate bar graphs.

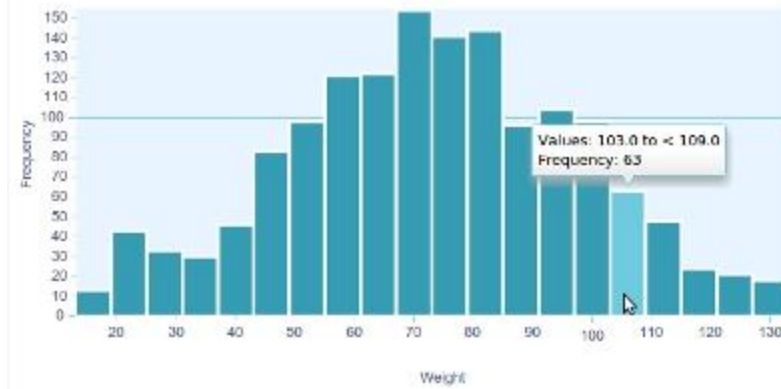


- Suppose that you and your friends emptied your pockets of coins and recorded the year marked on each coin. The distribution of dates would be skewed to the left. Explain why?
- Do you expect the distribution of the total player payroll for each of the 30 teams in Major League Baseball to be roughly symmetric, clearly skewed to the right, or clearly skewed to the left? Why?
- For each of the histograms shown below, interpret the graphs as best as possible. Describe the distribution as symmetric or skewed (left or right), and if there are any outliers. Describe any other salient features of the graph.

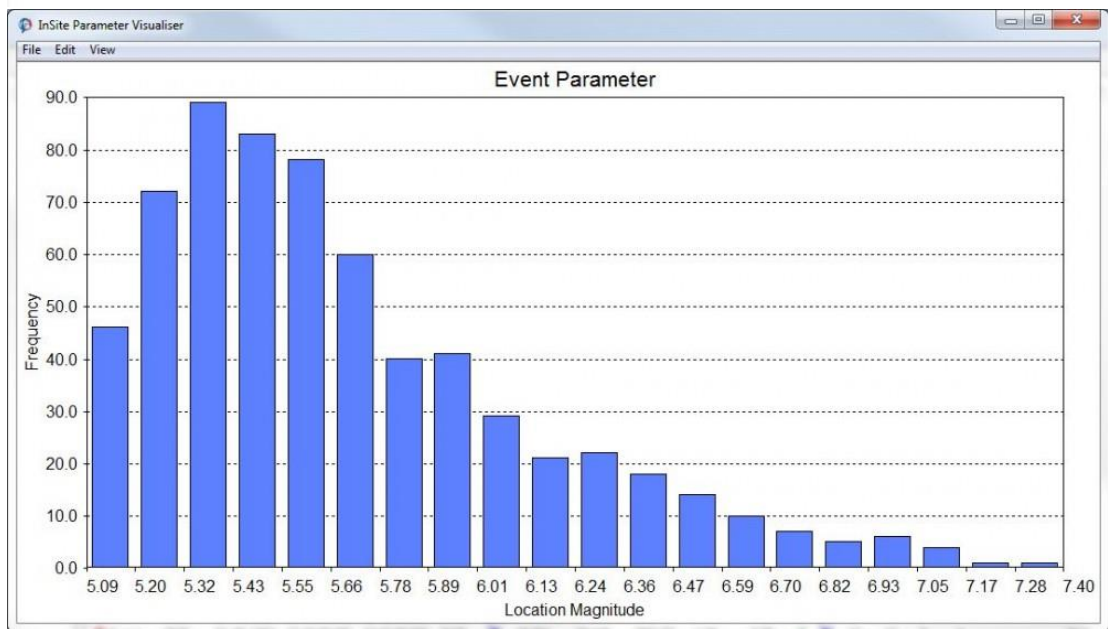




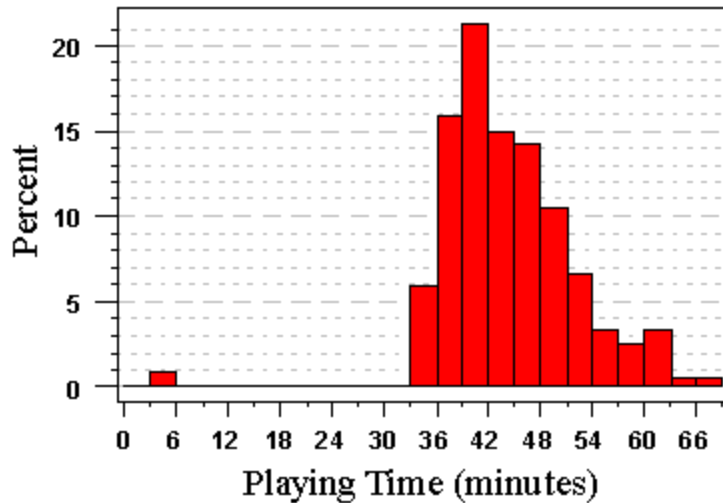
b)



c)



d)



e)

- The median income of US households in 2010 was about \$49,455. Explain in plain language what the 'median income' is.
- Echo Media reports that the average income for readers of the business magazine Forbes is \$217,000. Is the median wealth of these readers greater or less than \$217,000. Why?
- Consumer Reports magazine presented the following data on the number of calories in a hotdog for each of 17 brands of meat hotdogs.

173	191	182	190	172	147	146	139	175
136	179	153	107	195	135	140	138	

Make a histogram and find the five-number summary. Use that data to create a box plot. How do the graphs compare? What data does the histogram represent better than the boxplot? What data does the boxplot represent better than the histogram?

- A news article reported that of the 411 players on NBA rosters in February 1998, only 139 'made more than the league average salary' of \$2.36 million. Was the figure reported the mean or the median? How can you tell?
- Use Excel to find the standard deviation of the data in Problem #7. What does the standard deviation mean in this context?
- Sketch density curves with the following properties: a) symmetric but not normal, b) skewed to the right.
- Draw a histogram for the length of French movies shown below. With 8 bins.

81	90	90	92	93	94	95	96	96	102
103	105	106	111	113	116	119	122	122	123
125	125	128	137	158					

- Convert the time data in the table above from minutes to hours (use 2 decimal places). Recreate your histogram. Then calculate the five-number summary, mean and standard deviation of the data. How does the unit conversion appear to affect the statistics? Do we get

the same results if we convert the statistical summaries before or after calculating the conversions?

13. For the data in the Excel file **154data4.xlsx**, use the information provided to answer the questions that follow:
- Make a histogram of the age of Presidents on their date of inauguration, and a separate one of their lifespan. Label each appropriately and describe the shape of the distributions. Based on the graphs, what age range appears to be the most common at inauguration? Which age range appears to be the most common lifespan?
 - Find a complete set of descriptive statistics for the M&M data. Find the mean, standard deviation, five-number summary, mode, range, etc. Create a boxplot and a histogram of the data. Label the graph appropriately.
 - Make a comparative boxplot of the paternal smoking data (data is birth weights of babies born to fathers who did and did not smoke). Explain what you see.

14. Use the data below in the table to calculate the weighted average.

Value	75	80	60	32	84	91	78
Weight	10%	20%	15%	5%	40%	3%	7%