

Statistics 104 - Laboratory 3

Looking at relationships

1. Calories in hotdogs: Where's the beef?

The caloric content of 32 hotdogs was determined in a food lab. Half of the hotdogs were made from meat while the other half were made from poultry. Below are the data.

Meat	Poultry
135 136 138 139	86 87 94 99
140 146 147 153	102 102 106 107
172 173 175 179	113 129 132 135
182 190 191 195	142 143 144 146

- Calculate a five number summary for caloric content of the Meat hotdogs.
- Calculate a five number summary for caloric content of the Poultry hotdogs.
- Construct box and whiskers plots, using a common scale, to compare the caloric content of Meat hot dogs to that of Poultry hotdogs.
- Calculate the sample mean and sample standard deviation each type of hotdog separately.
- Use the statistical summaries to compare and contrast the two types of hotdogs.

2. Does eye color differ across the two sexes?

Over the past 5 years students taking a general introductory statistics class provided information about themselves at the beginning of the class. Two questions that were asked were: What is your sex? and What is your eye color? Below is a summary table of responses for 1,704 students who responded.

	Blue	Brown	Green	Hazel	Total
Female	313	290	175	156	934
Male	310	240	85	135	770
Total	623	530	260	291	1704

- Calculate the percentage of each eye color for all 1,704 students and use this to construct an appropriately labeled bar chart.
- Calculate the percentage of each eye color for the 934 females and separately for the 770 males, i.e. compute row percentages.
- Display the percentages you found in b. so as to compare females to males.
- Briefly compare and contrast eye colors for females and males.

3. M&Ms

For a random sample of 10 Fun Size Bags of M&Ms, the Weight (g) (contents plus bag) and the number of M&Ms are recorded below.

Bag	1	2	3	4	5	6	7	8	9	10
Number, x	18	19	17	19	20	17	17	19	19	21
Weight (g), y	17	18	16	17	18	15	16	19	17	20

- Plot the data.
- Describe the general relationship between the number of M&Ms in a bag and the Total Weight of the bag plus contents.
- Given that $\sum(x - \bar{x})(y - \bar{y}) = 16.2$, compute the value of the correlation coefficient, r. Hint: You will need to calculate \bar{x}, s_x, \bar{y} , and s_y .

4. Guessing Correlation

A site on the web <http://istics.net/stat/Correlations/> allows you to guess the correlation for various randomly generated data sets. Below is an example. Match the correlations with the plots.

Match the correlations with the plots.

Answers

2. Does eye color differ across the two sexes?

a. Bar chart of eye color.

b. Compute row percentages.

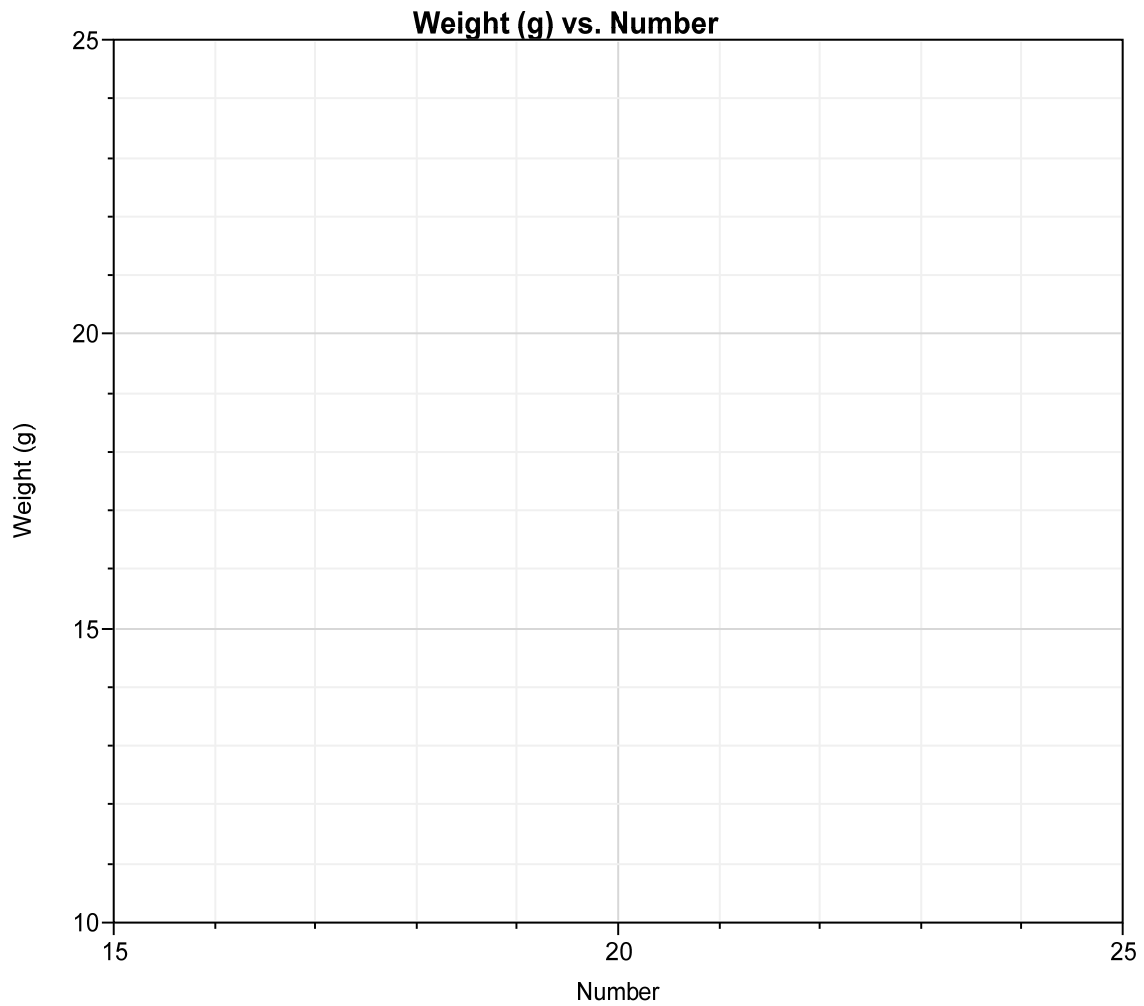
	Blue	Brown	Green	Hazel
Female				
Male				

c. Display the percentages you found in b. so as to compare females to males.

d. Briefly compare and contrast eye colors for females and males.

3. M&Ms

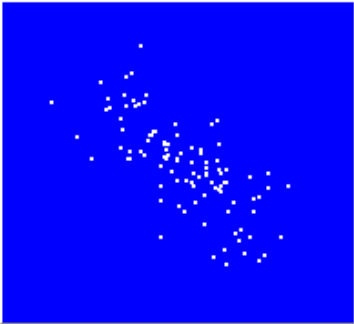
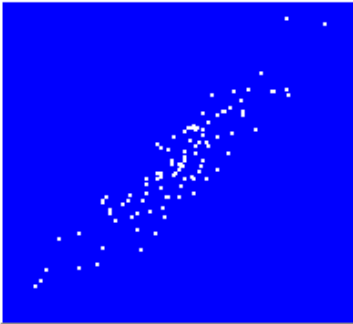
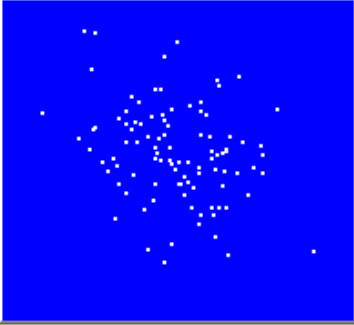
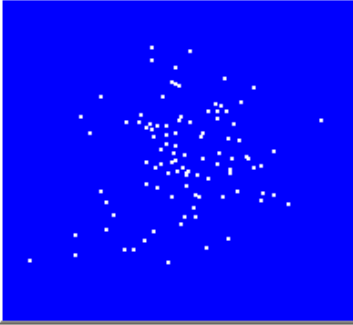
a. Plot the data



b. Describe the general relationship.

c. Compute the correlation coefficient, r .

4. Guess the correlation

	<input checked="" type="radio"/> 0.91 <input type="radio"/> 0.16 <input type="radio"/> -0.28 <input type="radio"/> -0.72		<input type="radio"/> 0.91 <input type="radio"/> 0.16 <input type="radio"/> -0.28 <input type="radio"/> -0.72
	<input type="radio"/> 0.91 <input type="radio"/> 0.16 <input type="radio"/> -0.28 <input type="radio"/> -0.72		<input type="radio"/> 0.91 <input type="radio"/> 0.16 <input type="radio"/> -0.28 <input type="radio"/> -0.72
Match the correlations with the plots.			Answers