

# AP Statistics Summer Assignment

## Objective

Students will use various methods to acquire a general knowledge of what they should expect to learn from this course.

## Tasks:

1. Work on the Data Types portion of the handout
2. Work on the calculator sections of the handout – Data and Lists, Lists and Scatter Plots
3. About a week before school, View “What is Statistics”, Against All Odds video #1, 16, and 2(in that order) through the [Learner Group](#)
4. Complete the reading guide to go along with video #1 (found at the end of this assignment), repeat for videos 16 and 2.

## Your responses

- a. Should be legible!
  - b. Should be e-mailed as attachments to my email address [tfox@portergaud.edu](mailto:tfox@portergaud.edu)  
- OR- printed out and turned in the first day of school.
5. Your responses will be turn in the first day of school.

## Grading

- Each part of this assignment will count as a homework assignment.
- We will go over the material the first few days of class
- There will be a 4.1/summer work quiz, and these concepts will also be on the Chapter 4 test

# Section 1: Data Types

There are two types of data:

**qualitative** (or categorical) and **quantitative**.

**Qualitative variables** or **categorical variables** are variables that categorize individuals (place them in groups). These variables may take on values that are labels for categories.

Examples are eye color (blue, hazel, etc.), gender (male or female), method of transportation to school (bike, car, bus, etc.), class rank (senior, junior, etc.). A specific type of qualitative variable is a binary variable. A **binary variable** is a qualitative variable that has only two outcomes.

Examples include gender, approve or disapprove of the president's handling of the war in Iraq, outcome of a coin toss, outcome of a die roll (when restricted to a four or not a four), the response to the question "Do you play basketball?"

**Quantitative variables** are numerical variables that represent an amount or quantity.

There are two kinds of these: discrete and continuous.

**Discrete variables** are quantitative variables that assume only a countable number of values.

Examples of these include shoe size (... , 6, 6 ½ , 7, 7 ½ , ...), score on a test, class size, number of cans collected for MIFA.

**Continuous variables** are quantitative variables that can assume an infinite number of values.

In the case of continuous variables, the values can generally assume any decimal quantity within a small range of values (even though we may round the answer like when we measure our height). These are typically values that result from some kind of measurement. The units of measurement are pounds/ inches/ Kelvin/ degrees/ feet/ etc. Examples are height, weight, surface area of oranges, era in baseball (3.23, 2.78, etc.), GPA.

Just because your variable's values are numbers, do not assume that it's quantitative. For example 9, 10, 11, and 12 are labels for different class rankings at MUSC. Class rank is a qualitative variable (even though it may be answered with a 9, 10, 11, or 12). Social security number is another example of a numerical output that is not a quantitative variable. SSN doesn't stand for any type of numerical quantity (you are not the 412,327,642 person born in the US!). Phone number is not a quantitative variable either. The 901 area code is a designation for a geographic region; it is not a numerical quantity.



Answer the following questions and then decide if the data is categorical or quantitative.

Then decide if it is also binary, discrete, or continuous.

<b>Question</b>	<b>Answer</b>	<b>Type</b>
<b>1. In which year did you take Algebra I?</b>	_____	_____
<b>2. How many CD's do you own?</b>	_____	_____
<b>3. What is your zip code?</b>	_____	_____
<b>4. Choose a random integer from 1 to 20</b>	_____	_____
<b>5. How many siblings do you have?</b>	_____	_____
<b>6. Do you like chocolate?</b>	_____	_____
<b>7. Who is your favorite math teacher?</b>	_____	_____
<b>8. What gender are you?</b>	_____	_____
<b>9. How tall are you (in inches)?</b>	_____	_____
<b>10. Where did you eat your last meal? (1=home, 2=restaurant, 3=other)</b>	_____	_____
<b>11. How many AP classes will you be taking this year?</b>	_____	_____
<b>12. How far away from school do you live?</b>	_____	_____
<b>13. How many miles per gallon does your vehicle get while driving in the city?</b>	_____	_____
<b>14. What grade did you earn in your last math class: A, B, C, D, or F?</b>	_____	_____
<b>15. What time is it?</b>	_____	_____
<b>16. How fast can you run "the 40"?</b>	_____	_____

## Section 2: Plotting Data

Practice with regression: If you are camping in the woods, can you tell what the temperature is if you know how fast a cricket chirps? Be sure to use chirps/minute as x and temperature as y.

Chirps/Min	Temperature(C)
110	18
110	19
130	20
135	21
154	23
158	24
179	26
201	29
210	31
230	32

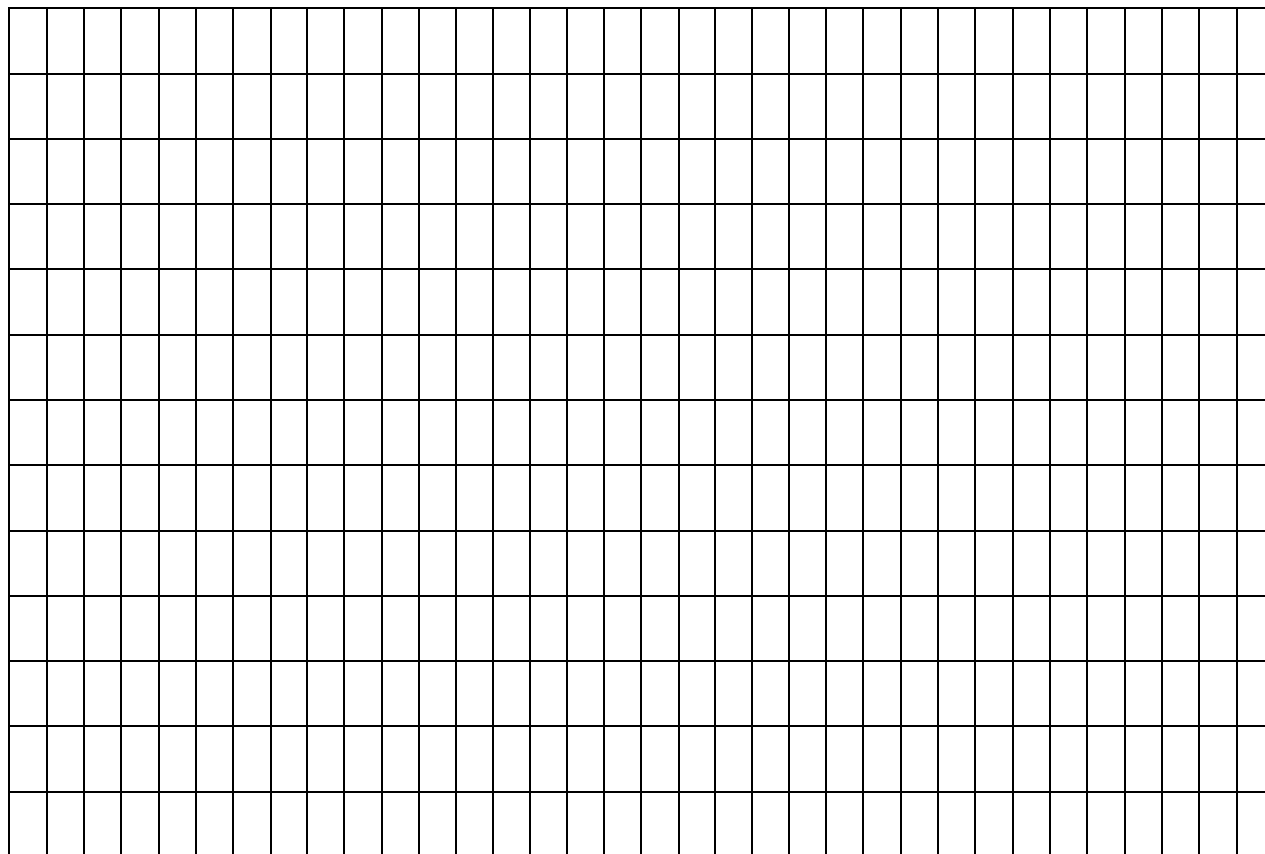
Enter this data into L1 and L2. (STAT → Edit)

Plot a scatterplot (the first choice in the plots, 2nd Y= Use L1 for your x's L2 for your y's 2<sup>nd</sup> 1, will allow you to type L1).

Zoom → stat will help you pick a decent window for the graph

Use the Window feature to help pick a reasonable (easier to reproduce scale)

Reproduce the scatterplot with scale and titled axes. Use a scale appropriate for the space provided. Indicate any breaks in your scale. Breaks may occur only at the beginning of an axis.

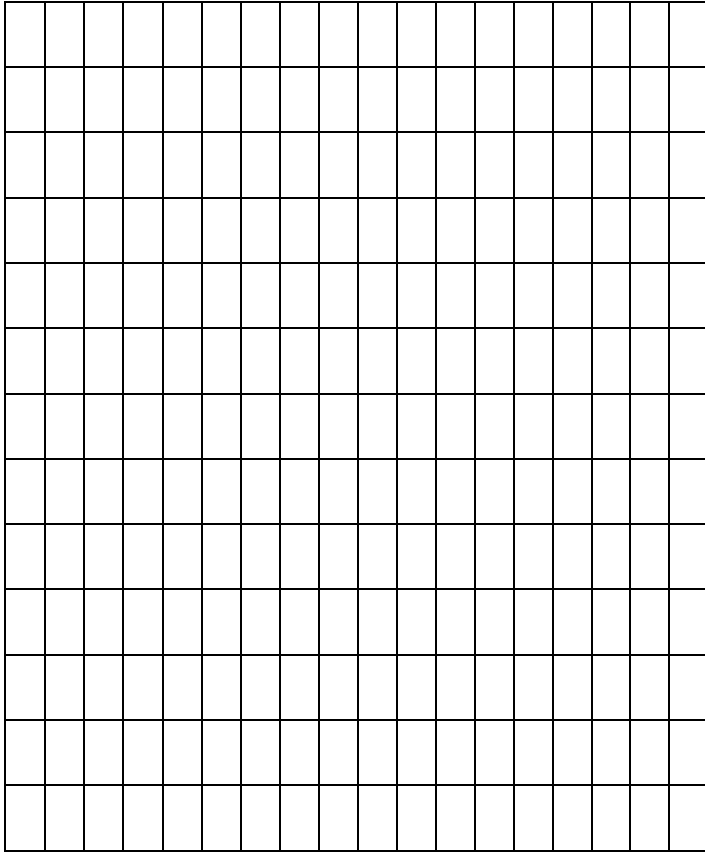


Use your TI-84 or N-Spire to find the equation of the line of best fit:

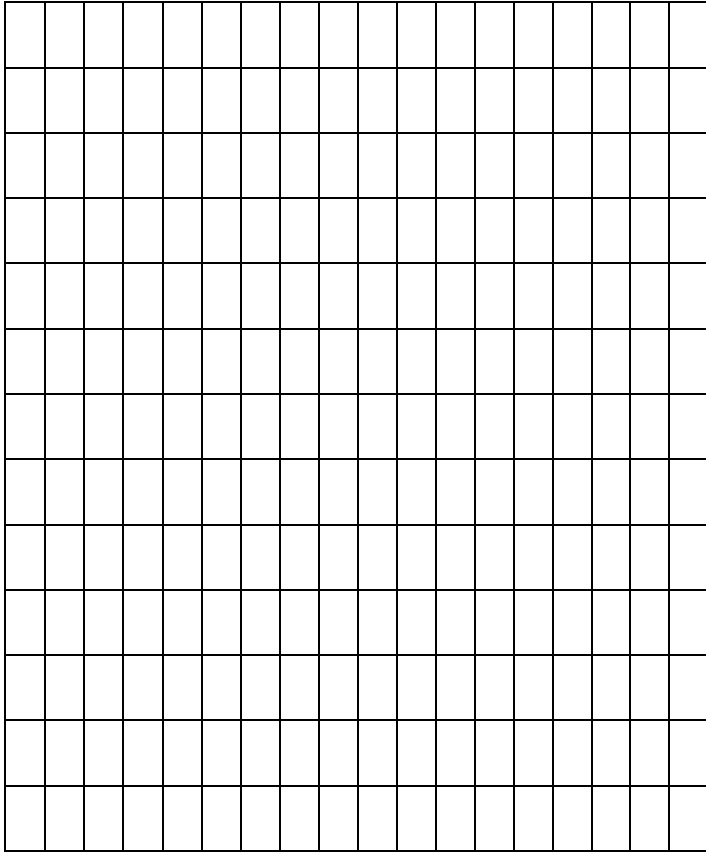
If there were 190 chirps per minute, what would you predict the temperature to be? (Don't forget to show your work and give units.)

Use your calculators to plot the following points. On the graphs below, plot the data given. Describe the data as linear, exponential, quadratic, or absolute value.

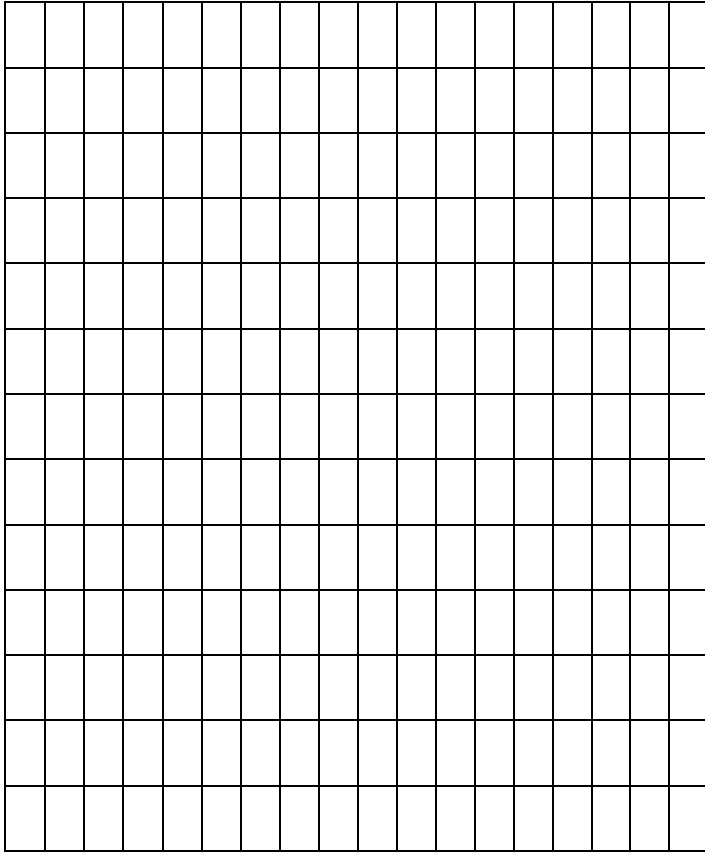
- a.  $(-3, 16.5)$   $(-2, 13)$   $(-1, 9.5)$   $(0, 6)$   $(1, 2.5)$   $(2, -1)$   $(3, -4.5)$  \_\_\_\_\_



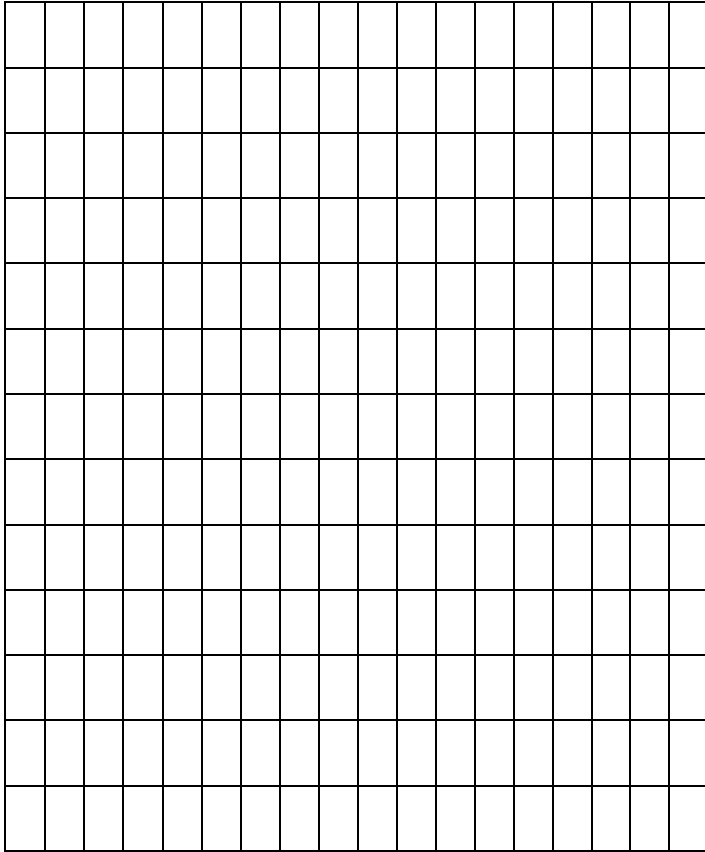
b.  $(-3, 3.15)$   $(-2, .85)$   $(-1, -1.45)$   $(0, -3.75)$   $(1.5, -0.3)$   $(2.5, 2)$   $(3, 3.15)$  \_\_\_\_\_



c. (-3, 0.354) (-2, 0.725) (-1, 1.524) (0, 3.2) (1, 6.720) (2, 14.112) (3, 29.635) \_\_\_\_\_



d.  $(-3, 4)$   $(-2, 7/3)$   $(-1, 4/3)$   $(0, 1)$   $(1, 4/3)$   $(2, 7/3)$   $(3, 4)$  \_\_\_\_\_





## Section 3 – Video Responses

**AGAINST ALL ODDS –** Name \_\_\_\_\_

### Videos 1, 16, and 2 (yes, in that order!)

1. What is the narrator's job?
  
2. Name 3 other fields that use statistics
  - a. \_\_\_\_\_, b. \_\_\_\_\_,
  
  - c. \_\_\_\_\_.
  
3. How did the natural resource manager use statistics?
  
  
  
  
  
  
  
  
  
  
4. What are the four steps in using statistics?
  - a. \_\_\_\_\_, b. \_\_\_\_\_,
  
  - c. \_\_\_\_\_, d. \_\_\_\_\_,
  
  
  
  
  
  
  
  
  
  
5. What type of statistics deals with drawing conclusions from data?
  
  
  
  
  
  
  
  
  
  
6. What is probability?

List 2 areas where it is used (other than in casinos!)

## Section 3 – Video Responses

7. The first census was directed by \_\_\_\_\_ in the year \_\_\_\_\_

What was the population of the US at that point?

8. Name two consequences of undercounting in the census?

9. What is a sample, and what must be done to make sure that our sample is valid?

10. \_\_\_\_\_ is present when certain outcomes are systematically favored,

11. What population was being tested using a simple random sample?

12. Name three other things that were also tested using a random sample by the same company?

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

13. Name two other graphs listed in the video on stemplots.

a. \_\_\_\_\_

b. \_\_\_\_\_

14. What are the two main purposes of graphing data?

a. \_\_\_\_\_

b. \_\_\_\_\_

15. What kind of data did the military folk collect and why?

16. A sample was described. Define the population (see why I had you watch the other video first?), then describe the sample.

17. What did the military learn from their sample measurements?

18. In the section on stemplots, what two data sets were compared in the back-to-back stemplot?

19. Name three things that the back-to-back stem plot helped us visualize?