

AP Statistics Summer Assignment: 2024-2025 School Year

Hello, future statisticians! I look forward to a fantastic year with you next year. To prepare yourself for AP Statistics, please complete the following items before next school year starts:

1. Purchase the book for the course:
The Practice of Statistics (for AP*)
Daren S. Starnes, Dan Yates, David S. Moore
4th ed.
W.H. Freeman and Company
ISBN-13: 978-1429245593
Used less than \$30 on Amazon (or very cheap at local used bookstores)
2. Complete the summary sheet attached at the end of this document as preparation for the Chapter 1 test within the first ten days of the school year (**summary sheet due on Friday, August 23rd, 2024**). We will spend a limited amount of time in class on these items before the Chapter 1 test. (Hint: you will have to read Chapter 1 of your Statistics textbook or watch the videos that will be available on AP Classroom).
3. Complete the attached lab (preferably after you've completed the summary sheet). Your product should be a poster that will be due on **Friday, August 23rd, 2024**.

Lab Activity for Unit 1

For this activity, you're going to create a professional-looking poster that could be put up on the wall of Mr. Smith's room! A nationwide survey gathered data from many students about many different variables (<https://ww2.amstat.org/censusatschool/RandomSampleExport.cfm>).

Individually, I ask that you individually create a poster of regulation size (at least 22" by 28") that answers the following questions related to the attached data. You will find it helpful to complete the summary sheet before you do this. This poster will be due by the end of the first week of school (Friday, August 23rd, 2024), and needs to contain your answers to all 9 questions below (note: this will mean there should be at least 6 graphical representations on your posters). You also may want to make sure the variables you choose from the list are of some interest to you!

1. (5 points) Name three variables that are categorical and three that are quantitative.
2. (5 points) Choose one categorical variable and make a frequency table based on that variable.
3. (5 points) Based on the variable you chose in (#2), make a bar graph representing the distribution of that variable.
4. (5 points) Choose one quantitative variable and make a stem-plot of that data.
5. (5 points) Using gender as a categorical variable, choose one quantitative variable and create a back-to-back stemplot that differentiates by the categorical variable.
6. (10 points) Choose a *different* quantitative variable from the one chosen in (#4) and create both a dotplot and a histogram of the data. Clearly label your histogram!
7. (5 points) For the histogram you made in (#6), describe the main features of the histogram using the descriptors on the summary page (describe the shape, choose and calculate an appropriate statistic to describe center and spread, and determine if there are any outliers).
8. (5 points) Choose a final quantitative variable *different* from the variables chosen in (#4) and (#6) and create a boxplot. Put the 5-number summary for the data below the boxplot.
9. (5 points) List three interesting facts you've learned about the data that are reflected in your graphical representations and put those facts on your poster!

The poster will receive the base score of 50 points for including your name, a title, and for high aesthetic quality (deductions may result for missing any of these items). The data follows in this document. Please note that there are 30 observations and 36 possible variables in total (you don't need to use all variables!).

Page 1 of data (continued on the next page – note that each person is labeled and is the same person throughout this document)

PERSON (don't use as a category)	Country	Region	DataYear	ClassGrade	Gender	Ageyears	Handed	Height_cm	Footlength_cm
1	USA	RI	2018	12	Female	17	Right-Handed	168	9
2	USA	TX	2012	8	Male	13	Right-Handed	188	26
3	USA	MD	2020	11	Male	17	Right-Handed	174	25
4	USA	WI	2017	11	Female	17	Right-Handed	162	23
5	USA	NC	2023	12	Male	18	Right-Handed	163	5
6	USA	CO	2015	12	Male	17	Right-Handed	196	30
7	USA	MD	2020	12	Female	17	Right-Handed	152	22
8	USA	KS	2018	9	Female	17	Right-Handed	168	27
9	USA	SC	2020	12	Male	14	Right-Handed	184	24
10	USA	CA	2015	4	Female	8	Right-Handed	127	19
11	USA	NH	2018	12	Male	17	Left-Handed	190	30
12	USA	SC	2024	12	Male	18	Right-Handed	173	25.4
13	USA	TX	2018	12	Female	17	Right-Handed	170	27
14	USA	CA	2015	12	Female	16	Ambidextrous	150	20
15	USA	NC	2013	6	Male	11	Right-Handed	140	21.5
16	USA	NC	2017	12	Female	17	Left-Handed	160	23
17	USA	OH	2018	12	Female	17	Left-Handed	168	26
18	USA	IL	2020	5	Male	10	Right-Handed	145	21
19	USA	GA	2018	9	Female	15	Right-Handed	163	2.1
20	USA	PA	2013	12	Male	16	Right-Handed	165	27
21	USA	OH	2023	12	Female	17	Right-Handed	175	24
22	USA	MI	2013	11	Female	15	Right-Handed	167	24
23	USA	FL	2014	12	Male	17	Right-Handed	167	25
24	USA	WI	2014	6	Male	10	Left-Handed	142	22
25	USA	AZ	2018	12	Female	18	Right-Handed	170	18
26	USA	MA	2019	12	Female	17	Right-Handed	166	25
27	USA	CA	2011	12	Female	18	Right-Handed	162	25
28	USA	CA	2018	12	Male	16	Right-Handed	170	10
29	USA	IN	2021	12	Female	17	Ambidextrous	157	5
30	USA	NC	2023	12	Male	18	Left-Handed	188	28

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PERSON Don't use as a category)	Armspan_cm	Languages_spoken	Travel_to_School	Travel_time_to_School	Favourite_physical_activity	Birth_mon
1	16	1	Car	5	Gymnastics	September
2	171	3	Bus	13	Football (American)	November
3	172	2	Car	40	Tennis	October
4	162	1	Car	8	Dancing	November
5	168	1	Car	20	Skateboarding/Rollerblading	November
6	197	2	Car	7	Golf	November
7	154	2	Bus	12	Dancing	May
8	160	1	Walk	45	Swimming	July
9	182	1	Car	10	Other	April
10	125	1	Car	12	Dancing	May
11	170	1	Car	8	Athletics	June
12	25.4	1	Car	10	None	May
13	160	2	Car	3	Running/Jogging	June
14	63	3	Car	15	Other	November
15	135	1	Car	8	Golf	June
16	170	2	Car	15	Dancing	August
17	160	1	Car	7	Baseball/Softball	May
18	140	2	Walk	5	Basketball	March
19	15.7	2	Car	5	Dancing	September
20	139.7	1	Bus	8	Swimming	April
21	176	1	Car	40	Other	October
22	159	1	Car	4	Basketball	July
23	170	2	Car	15	Baseball/Softball	September
24	136	2	Car	5	Other	April
25	165	1	Car	16	Other	April
26	73	1	Car	3	Walking/Hiking	July
27	171	1	Car	10	Dancing	September
28	165	2	Car	45	Cycling	April
29	7	1	Bus	10	Basketball	September
30	186	1	Walk	4	Running/Jogging	October

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PERSON don't use as a category)	Favorite_Season	Allergies	Vegetarian	Beverage	Favorite_School_Subject	Sleep_Hours_Schoolnight
1	Summer	Yes	No	Water	Art	1
2	Summer	No	No	Milk	Physical education	
3	Winter	No	No	Tea	Computers and technology	
4	Fall	Yes	No	Water	English	
5	Fall	No	No	Soft drink (caffeinated)	Mathematics and statistics	
6	Fall	Yes	No	Water	Science	
7	Fall	Yes	No	Water	Other	
8	Summer	Yes	No	Water	Music	
9	Fall	No	No	Water	Social studies	
10	Summer	Yes	No	Water	Art	1
11	Winter	Yes	No	Water	Mathematics and statistics	
12	Fall	No	No	Soft drink (caffeinated)	History	
13	Fall	Yes	No	Soft drink (caffeinated)	English	
14	Summer	Yes	No	Water	Social studies	
15	Summer	No	No	Soft drink (caffeinated)	Physical education	
16	Fall	No	No	Water	Other	
17	Winter	No	No	Water	Science	
18	Summer	No	No	Water	Mathematics and statistics	1
19	Summer	No	No	Juice	Mathematics and statistics	
20	Summer	No	No	Water	Other	
21	Summer	No	No	Water	Science	
22	Summer	Yes	No	Soft drink (caffeinated)	Art	
23	Summer	No	No	Water	Science	6.
24	Spring	Yes	No	Water	Science	1
25	Winter	No	No	Soft drink (non- caffeinated)	History	
26	Spring	No	No	Water	History	
27	Spring	No	No	Water	Art	
28	Winter	No	No	Water	Other	
29	Spring	Yes	No	Juice	Other	
30	Fall	Yes	No	Water	Science	

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PERSON don't use a category)	Sleep_Hours _Non_Schoo lnight	Home_ Occup ants	Text_Messages_ Sent_Yesterday	Text_Messages_ Received_Yester day	Hanging_Out_ With_Friends_ Hours	Talking_On _Phone_Ho urs	Doing_Home work_Hours	Outdoor_ Activities _Hours
1	11	4	0	0	0	1	2	1
2	11	4	200	205	60	1	1	10
3	12	4	20	20	10	1	50	5
4	10	4	35	50	10	5	15	16
5	12	6	9	6	0	1	3	0
6	7	6	30	40	20	1	5	30
7	10	5	130	149	2	1	24	0
8	12	4	5	5	7	100	0	1
9	9	5	10	10	3	12	18	4
10	10	4	0	0	20	1	4	10
11	11	4	10	45	5	1	0	3
12	9	3	4	3	1	0	0	0
13	5	3	45	35	1	3	10	0
14	11	4	0	1	0.2	0	50	1
15	7	4	30	45	45	1	2	75
16	9	5	200	200	3	8	20	0
17	9	3	30	30	12	2	30	1
18	10	5	0	0	7	0	1	9
19	10	4	100	150	10	15	1	8
20	8	3	8	10	5	0	10	12
21	10	5	15	10	10	2	7	20
22	8	4	0	0	5	1	5	10
23	10	3	125	115	6	4	10	2
24	9	4	0	0	5	2	1.5	2
25	10	7	75	150	9	24	8	4
26	12	3	50	50	3	0	4	1
27	6	3	6	6	17	1	1	2
28	9	4	0	2	0	0	2	0
29	9	5	10	20	7	4	2	0
30	13	5	20	100	20	2	15	4

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PERSON on't ie as a tegrity)	Video_Games _Hours	Watching_TV_ Hours	Paid_Work_ Hours	Favorite_Music	Superpower	Preferred_ Status	Charity_Donation
1	0	1	0	Gospel	Super strength	Healthy	International aid
2	15	0	1	Rap/Hip hop	Freeze time	Famous	Education/Youth dev
3	0	0	0	Other	Freeze time	Healthy	Religious
4	0	10	5	Country	Invisibility	Healthy	Health
5	2	2	15	Pop	Invisibility	Happy	Environment
6	5	2	0	Rap/Hip hop	Fly	Happy	Environment
7	1	0	0	Pop	Telepathy	Healthy	Health
8	0	12	0	Other	Freeze time	Healthy	Other
9	9	0	0	Country	Telepathy	Happy	Health
10	0	2	0	Pop	Telepathy	Happy	International aid
11	4	4	6	Rock and roll	Super strength	Healthy	Environment
12	9	3	0	Techno/Electronic	Freeze time	Happy	Environment
13	0	15	35	Punk rock	Freeze time	Rich	Wildlife, animals
14	0	0	0	Pop	Fly	Happy	Wildlife, animals
15	25	10	1	Rap/Hip hop	Super strength	Famous	Religious
16	0	6	0	Other	Telepathy	Rich	International aid
17	0	30	0	Rhythm and blues (R&B)	Telepathy	Happy	International aid
18	2	4	0	Rap/Hip hop	Freeze time	Healthy	International aid
19	0	49	0	Rap/Hip hop	Telepathy	Happy	Health
20	0	5	12	Country	Telepathy	Happy	International aid
21	0	2	12	Country	Invisibility	Rich	Health
22	0	32	0	Pop	Fly	Rich	Arts, culture, sports
23	0	6	32	Techno/Electronic	Telepathy	Happy	Health
24	10	5	0	Country	Fly	Happy	Health
25	0	0	35	Punk rock	Freeze time	Happy	Wildlife, animals
26	1	1	20	Other	Fly	Happy	Environment
27	0	6	3	Other	Telepathy	Happy	International aid
28	0	0	0	Classical	Freeze time	Happy	Health
29	0	1	0	Rap/Hip hop	Telepathy	Happy	Health
30	2	2	0	Rap/Hip hop	Freeze time	Rich	Arts, culture, sports

AP Statistics Summary Sheet (Unit 1: Exploring Data)

Introduction

What is the difference between an individual and a variable?
Give an example.

What is the difference between a categorical and quantitative variable?
Give an example.

The _____ of a variable tells us what values the variable takes and how often it takes these values.

Bar graph example:

Pie chart example:

Segmented bar graph example:

Provide an example of each of the following types of graphs below:

	Boxplot	Stemplot	Dotplot	Histogram
Example				
Explain how to create...	(p. 59) A central box is drawn from ____ to ____. A line in the box represents the _____. Outliers marked with _____	(p. 33) Separate into stems (all but _____ digit) leaf (_____ digit). Skip stems? ____ Arrange leaves in _____ order out from stem. Provide a key: e.g. 7 3 means _____.	(p. 27) Draw, label, and scale a _____ axis. Mark a _____ above the location corresponding to each _____.	(p. 35) Divide data into _____ of _____ width. Find the _____ of individuals in each class. _____ and _____ your axes. Draw height of bars with _____ horizontal space.

Provide an example below of a two-way table. Then highlight a marginal distribution and a conditional distribution.

We say there is an _____ between two variables if specific values of one variable tend to occur in common with specific values of the other.

Describing a distribution of quantitative variable (SOCS):

"S" stands for shape...complete the chart below:

Shape:	Symmetric	Skewed Left	Skewed Right	Uniform	Bimodal
Example graph					
Mean vs. median		Mean < median			

"O" stands for outliers (a value that lies outside the overall pattern of the distribution)...What are the two ways we can calculate outliers?

Provide a graph to the right that demonstrates gaps in the data:

"C" stands for center:

Measure	How to calculate	Is it resistant to outliers?
Mean (μ for population, \bar{x} for sample)		
Median	For odd # of observations: For even # of observations:	

"S" stands for spread:

Measure	How to calculate	Is it resistant to outliers?
Range		
Standard deviation How does variance relate? _____		
Q1 and Q3 IQR (Interquartile Range)		