

AP Stats

Unit 01 – Univariate Data

Day 2 Notes (1.1-1.2)

Name _____

OVERALL PATTERN OF A DISTRIBUTION

Distribution:

When describing all distributions, you must include the following:

SHAPE:

a) Symmetric:

b) Skewed right:

c) Skewed left:

OUTLIERS:

CENTER:

SPREAD:

Example: Are You Driving a Gas Guzzler?

The Environmental Protection Agency (EPA) is in charge of determining and reporting fuel economy rating for cars (think of those large window stickers on a new car). For years, consumers complained that their actual gas mileages were noticeably lower than all the values reported by the EPA. It seems that the EPA's tests – all of which are done on computerized devices to ensure consistency – did not consider things like outdoor temperature, use of the air conditioner, or realistic acceleration and braking by drivers. In 2008, the EPA changed the method for measuring a vehicle's fuel economy to try to give more accurate estimates. The table below displays the EPA estimates of highway gas mileage in miles per gallon (mpg) for a sample of 24 model year 2009 midsize cars.

Model	MPG	Model	MPG	Model	MPG
Acura RL	22	Dodge Avenger	30	Mercury Milan	29
Audi A6 Quattro	23	Hyundai Elantra	33	Mitsubishi Galant	27
Bentley Arnage	14	Jaguar XF	25	Nissan Maxima	26
BMW 528i	28	Kia Optima	32	Rolls Royce Phantom	18
Buick Lacrosse	28	Lexus GS 350	26	Saturn Aura	33
Cadillac CTS	25	Lincoln MKZ	28	Toyota Camry	31
Chevrolet Malibu	33	Mazda 6	29	Volkswagen Passat	29
Chrysler Sebring	30	Mercedes-Benz E350	24	Volvo S80	25

Create a dot plot with the given information and then describe the distribution.

SHAPE:

OUTLIERS:

CENTER:

SPREAD:

HISTOGRAMS

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Example: Born Outside the US

What percent of your home state's residents were born outside the United States? The country as a whole has 12.9% foreign-born residents, but the states vary from 1.2% in West Virginia to 27.2% in California. The table below presents the data for all 50 states. It is much easier to see from a graph than from the table how your state compares with other states.

State	Percent	State	Percent	State	Percent
Alabama	2.8	Louisiana	2.9	Ohio	3.6
Alaska	7.0	Maine	3.2	Oklahoma	4.9
Arizona	15.1	Maryland	12.2	Oregon	9.7
Arkansas	3.8	Massachusetts	14.1	Pennsylvania	5.1
California	27.2	Michigan	5.9	Rhode Island	12.6
Colorado	10.3	Minnesota	6.6	South Carolina	4.1
Connecticut	12.9	Mississippi	1.8	South Dakota	2.2
Delaware	8.1	Missouri	3.3	Tennessee	3.9
Florida	18.9	Montana	1.9	Texas	15.9
Georgia	9.2	Nebraska	5.6	Utah	8.3
Hawaii	16.3	Nevada	19.1	Vermont	3.9
Idaho	5.6	New Hampshire	5.4	Virginia	10.1
Illinois	13.8	New Jersey	20.1	Washington	12.4
Indiana	4.2	New Mexico	10.1	West Virginia	1.2
Iowa	3.8	New York	21.6	Wisconsin	4.4
Kansas	6.3	North Carolina	6.9	Wyoming	2.7
Kentucky	2.7	North Dakota	2.1		

The *individuals* in this data set are _____.

The *variable* is _____.

Create a histogram by hand, then describe the distribution.

Percentile:

Note: You cannot be in the 100th percentile.

Example:

The test scores for 25 students are shown below.

79 81 80 77 73 83 74 93 78 80 75 67 73

77 83 86 90 79 85 83 89 84 82 77 72

1. Use the scores to find the percentiles for the following students

a) a score of 72

b) a score of 93

c) the 2 students who scored an 80

Cumulative Relative Frequency Graphs (O-GIVE)

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Example:

Here is a frequency table that summarizes the ages of the first 44 US presidents when they were inaugurated:

Age	Frequency
40-44	2
45-49	7
50-54	13
55-59	12
60-64	7
65-69	3

Steps to create an O-GIVE:

- 1.
- 2.
- 3.
- 4.

In what percentile was Bill Clinton's age at inauguration? He was 46 when he took office.

In what percentile was Ronald Reagan's age at inauguration? He was 69 when he took office.

What age at inauguration corresponds to the 50th percentile?

What is the range of ages at inauguration for the middle 50% of presidents?

Time Plots

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Trend:

Seasonal variation: