

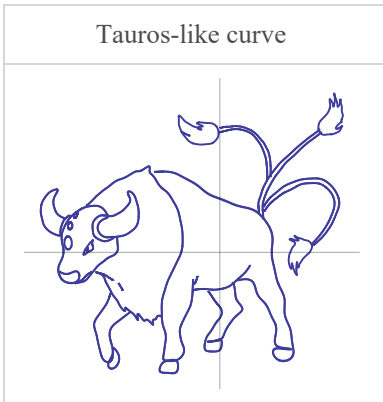
MATH:1260 Pokémath

The Mathematics of Pokémon Go[®]

Week 10 Monday, Spring 24

Popular curve:

Tauros-like curve



Plan for Today

- Module 2: Gotta Catch 'em All®
 - More Statistics

Class Reminders

- Project 2 work day in discussion on Thursday.
 - Extra credit once again available!
- Project 2 Stage 2: Data due Wednesday at Midnight.
- Project 2 Stage 3: Report due Wednesday April 3 at Midnight.

First, a note...

Statistics communicates information
misinformation

Average or Mean

One measure for the “center” of data is the average or the mean.

Notation \bar{x} *x-bar*

Definition: The **mean** of $x_1, x_2, x_3 \dots x_n$ is

$$\bar{X} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

Eggs

I kept a little data from my recent eggs.

Of the eggs from stops, the ten most recent have been

4 of the green 2km eggs

5 of the orange 5km eggs

1 of the purple 10km eggs

What is the average distance I will have to walk to hatch these eggs?
(assuming regular incubators)

$$\frac{4 \cdot 2 + 5 \cdot 5 + 1 \cdot 10}{10} = 4.3$$

Voltorb

In the data set you worked with on Thursday. There were

26 Voltorbs with 0 stars

14 Voltorbs with 1 star

11 Voltorbs with 2 stars

3 Voltorbs with 3 stars

TopHat: What is the average number of stars in this data set?

$$\frac{26 \cdot 0 + 14 \cdot 1 + 11 \cdot 2 + 3 \cdot 3}{26 + 14 + 11 + 3} = .8\bar{3}$$

Other measures of “Center”

Median

The **median** of a data set is the point such that half of the remaining data points are above it, and half are below it.

Mode

The **mode** of a data set is the data value that appears the most.

Median: the middle data value

We recall Dr. M's collection of Zapdos and their IV sums:

37, 40, 37, 36, 36, 43, and 38

How do we find the median?

Sort the data, write the data points in order

36, 36, 37, 37, 38, 40, 43

3 below

3 above

average: 38.1

How about Rayquaza and their IV sums?

40, 38, 41, 40, 37, and 39

37, 38, 39, 40, 40, 41

If you find no exact middle data point, take the average of the two closest.

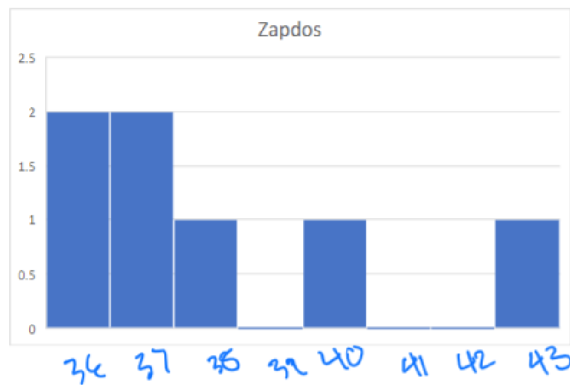
$$\rightarrow \frac{39+40}{2} = \boxed{39.5} \quad \text{true median}$$

Mode: the most frequent entry

Let's use Zapdos IV sums as another example:

37, 40, 37, 36, 36, 43, and 38

How do we find the mode? Look for the data value(s) that appears the most



\Rightarrow 36, 37
are modes for this data set.

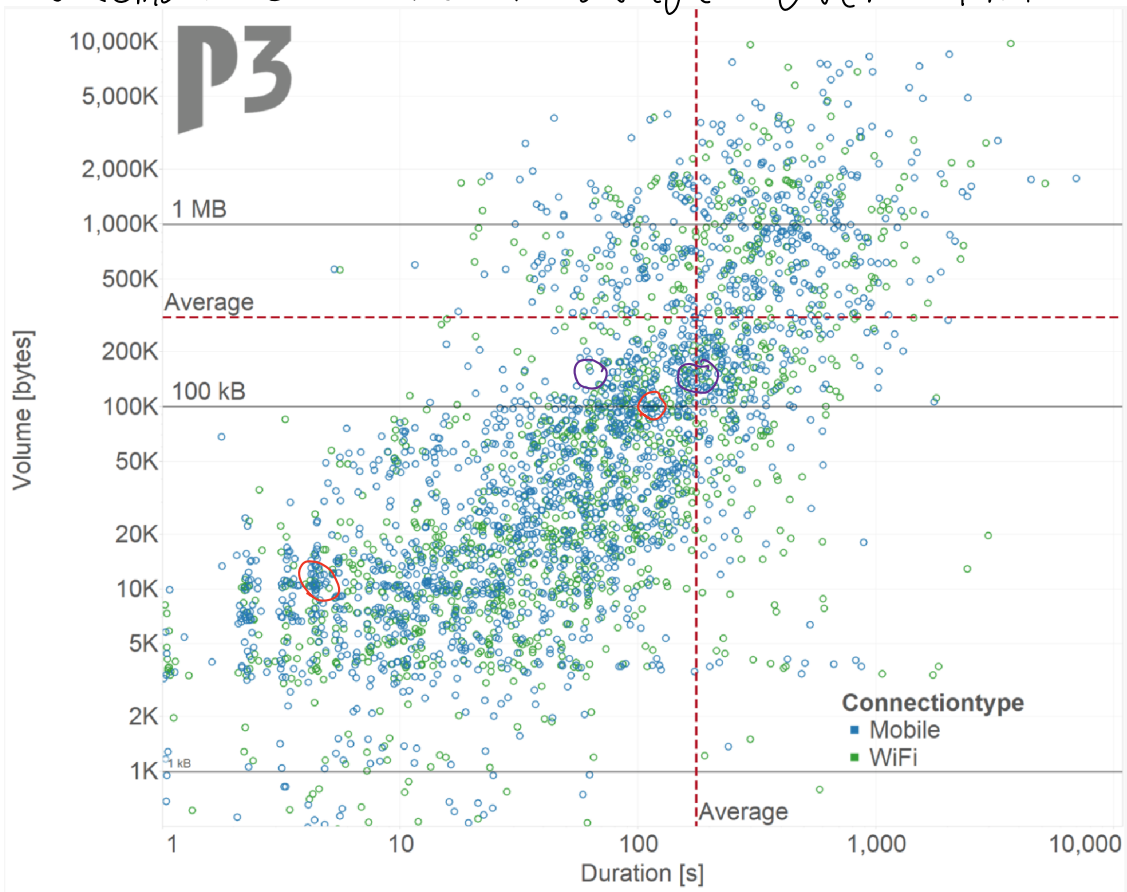
Rayquaza? 40, 38, 41, 40, 37, and 39

\Rightarrow 40 is the mode

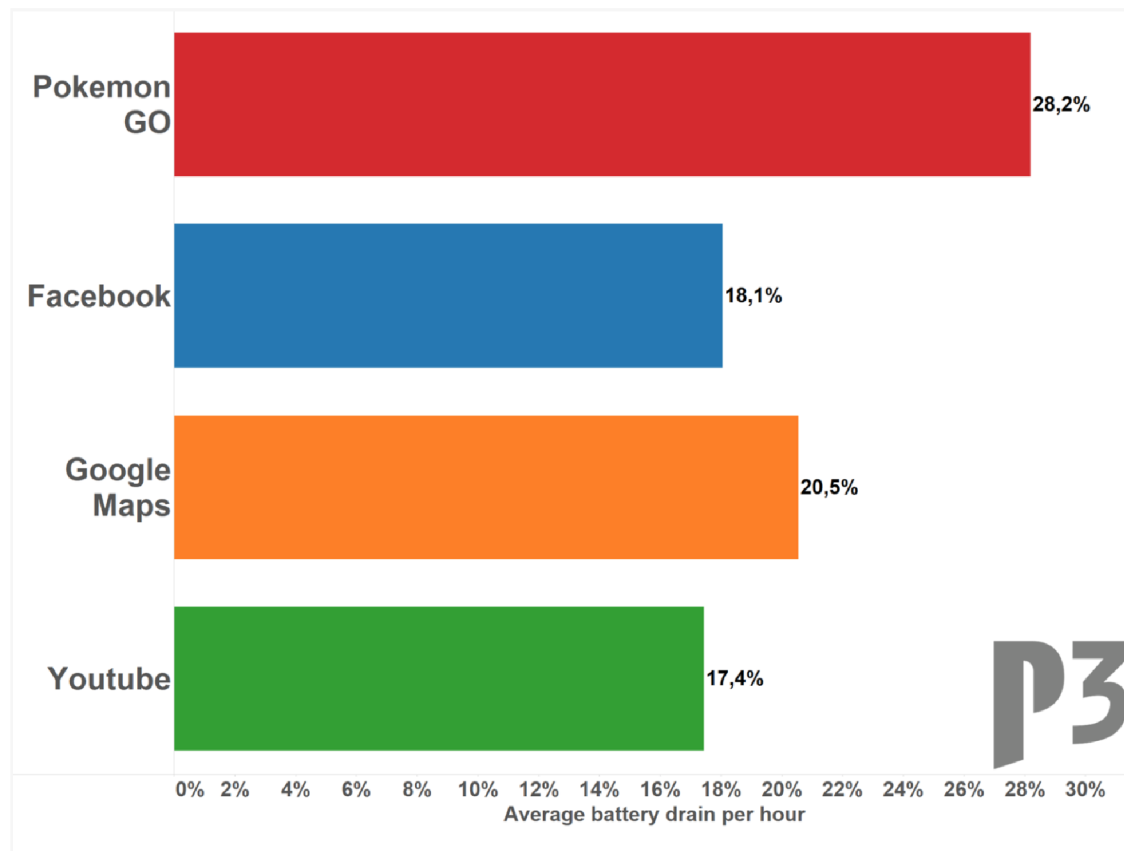
Data

Perhaps some of you have noticed, Pokemon GO chews through phone data!

Pokemon GO Data usage over time

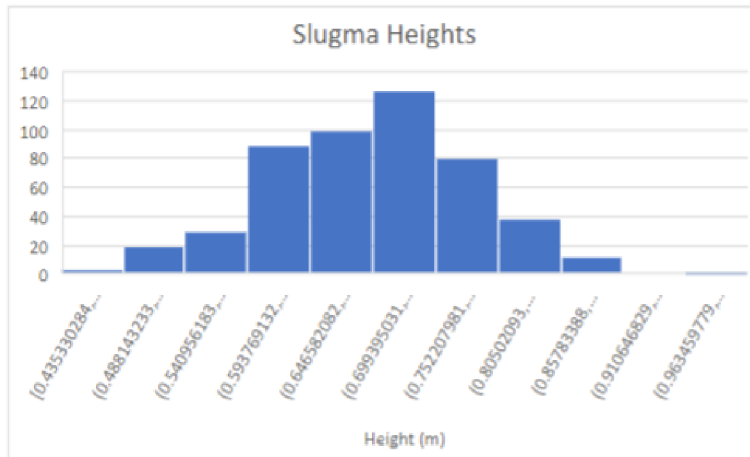


Battery Drain



Slugma

Here is a data set of the heights of many, many Slugma, collected by TAs over the years.



Mean for this data set of 500 Slugma is 0.699m.

What do you notice about the shape of the curve? The median and mode?

Normal Distribution

The height of each Pokemon is chosen from a **Normal Distribution**.

The means are given in this chart by species:

<https://pokemondb.net/pokedex/stats/height-weight>

	218	Slugma	FIRE	2'04"	0.7	77.2	35.0	71.4
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