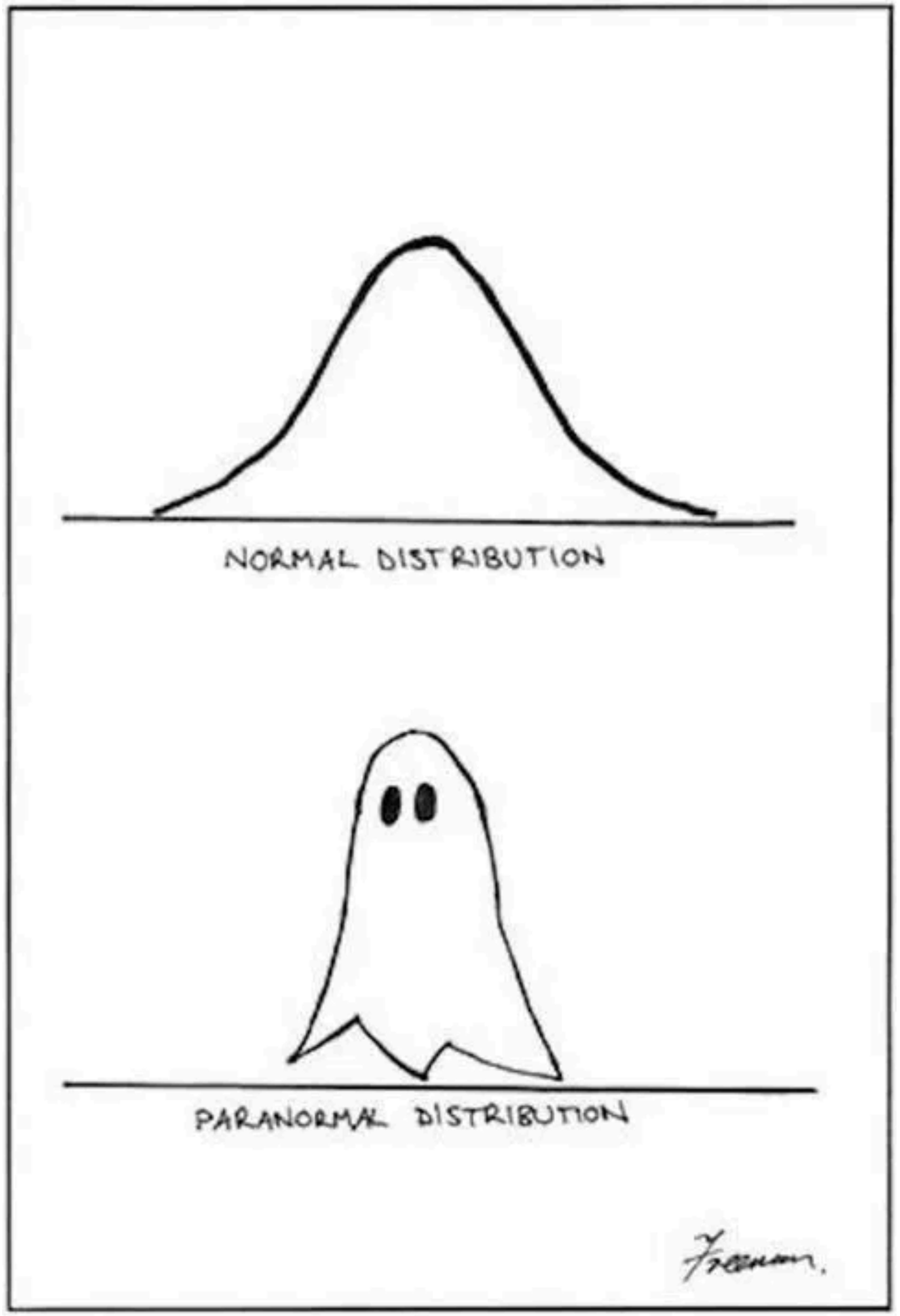
PH142 LAB 6

MARCH 7TH, 2019

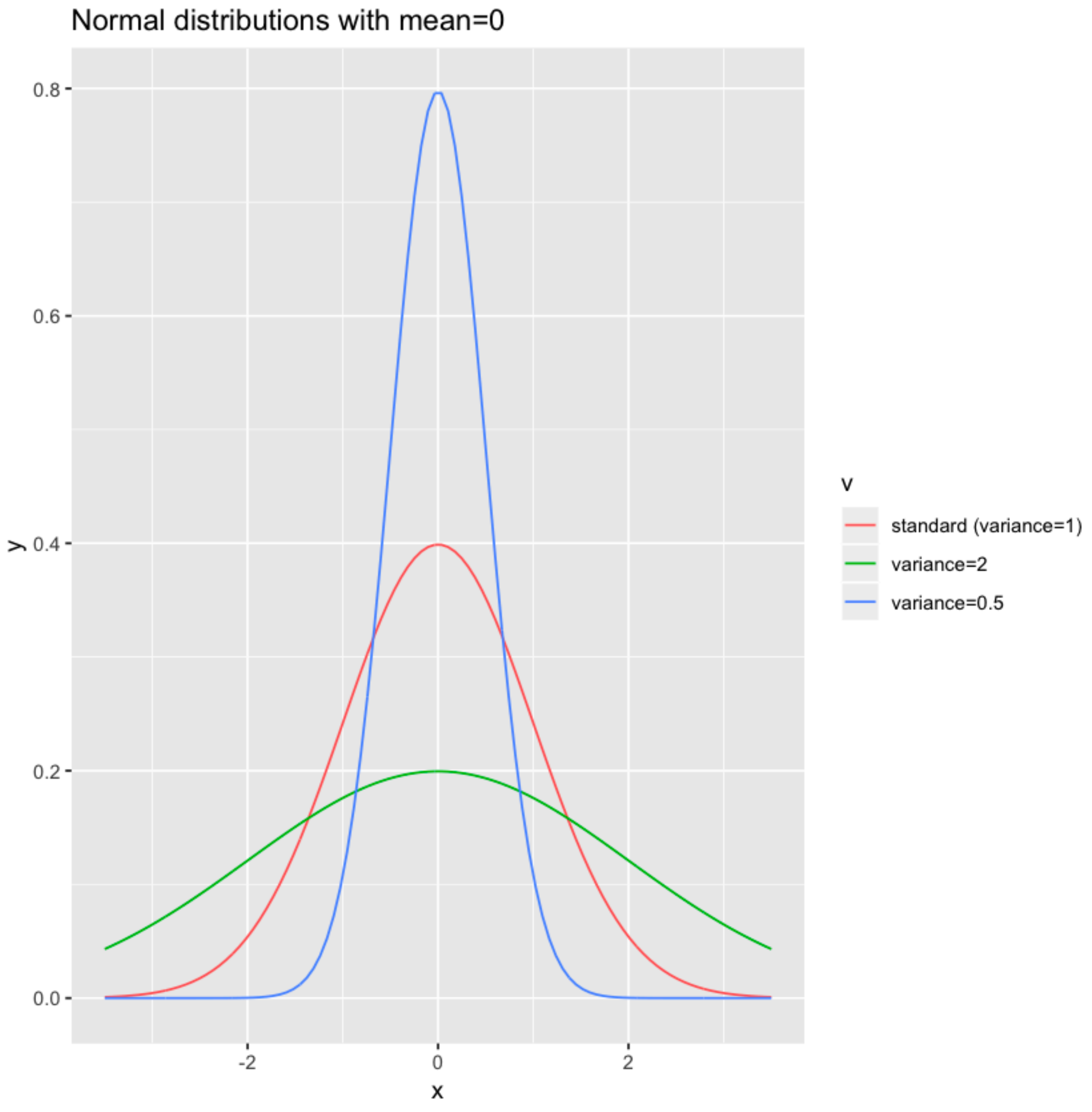


Notes on homework

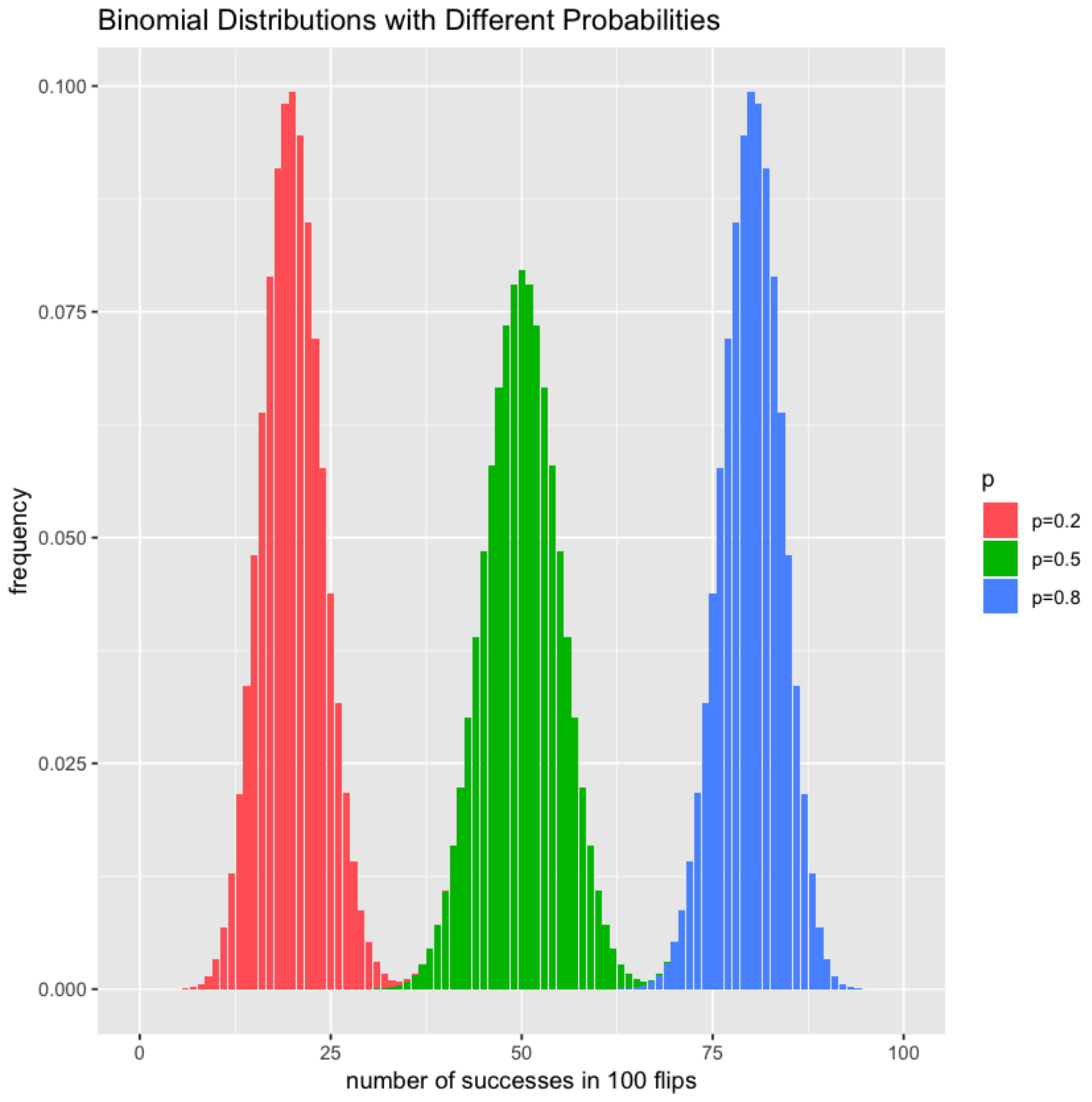
- Use bCourses discussion board like Piazza
- Do not copy and paste slides
- You do not need to number your pages
- Read in your libraries
- Office hours on Fridays if you need me
- This upcoming assignment will be due Wednesday at 11:59pm

Don't wait till last minute!
Come to my office hours for any type of help even if you haven't started yet!

Last Week



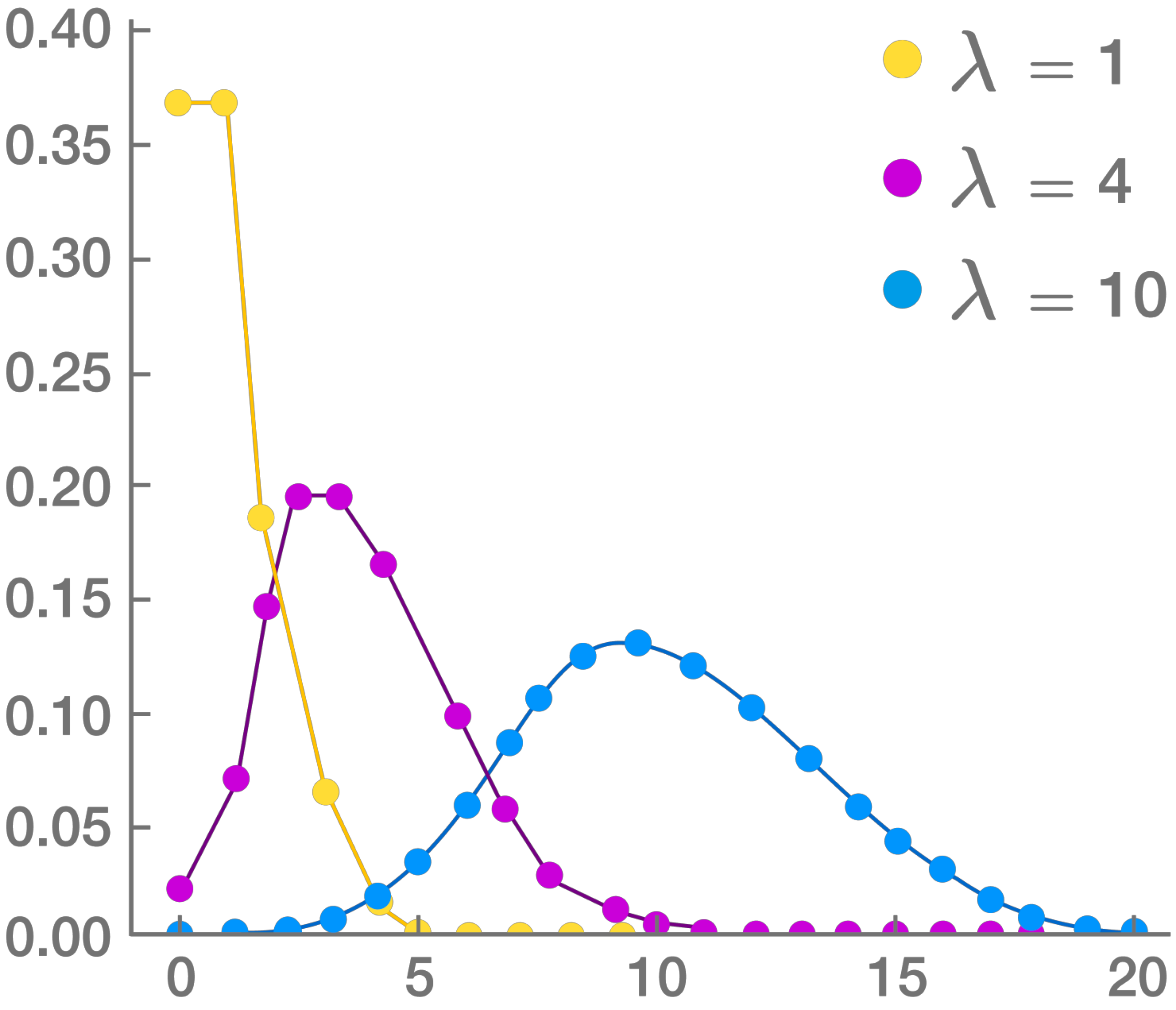
Normal distributions with mean=0
y
x
0.0
0.2
0.4
0.6
0.8
-2
0
2
v
standard (variance=1)
variance=2
variance=0.5



Binomial Distributions with Different Probabilities
frequency
number of successes in 100 flips
0.000
0.025
0.050
0.075
0.100
0
25
50
75
100
p
p=0.2
p=0.5
p=0.8

This Week

The Poisson Distribution will be covered in discussion section.



Warm up

1. What are each of the pieces in the formula for the Binomial distribution? $P(X = k) = nCk(p)^k(1 - p)^{n-k}$

2. What is the probability that at least 5 people in 10 fixed trials succeed when the probability of success is 0.2?

3. The poisson distribution models _______ events.

4. Here's a poisson distribution. What is the mean and how do you interpret the mean? $P(X = k) = e^{-2}\frac{2^k}{k!}$

5. [T/F] Disjoint events are dependent.

Warm up

1. What are each of the pieces in the formula for the Binomial distribution? $P(X = k) = nCk(p)^k(1 - p)^{n-k}$

X is the random event, n is the number of fixed trials, k is the number of successes, p is the probability of success

2. What is the probability that at least 5 people in 10 fixed trials succeed when the probability of success is 0.2? choose(10,5)*0.2^5*0,8^5

3. The poisson distribution models ___rare___ events.

4. Here's a poisson distribution. What is the mean and how do you interpret the mean? $P(X = k) = e^{-2}\frac{2^k}{k!}$

The mean is 2. We have a Poisson(2) based on the formula. k is the number of successes. The mean is the number we expect per unit time.

5. [T/F] Disjoint events are dependent.

True

Central Limit Theorem

Draw an SRS of size n from any population with mean (mu) and standard deviation (sigma). When n is large, the sampling distribution of the sample mean (X-bar) will eventually be

$$N(\mu, \frac{\sigma}{\sqrt{n}})$$

Any sampling *distribution*, no matter its original shape will become asymptotically normal!

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`pnorm` `pnorm` `pnorm` `pnorm` `pnorm` `pnorm` `pnorm`

Any sampling *distribution*, no matter its original shape will become asymptotically normal!

`pnorm` `pnorm` `pnorm` `pnorm` `pnorm`

Law of Large Numbers

When you increase n, your statistic will eventually tend to the true parameter.

Lab 6

Today, we're going to be pulling samples from a census to show you how Central Limit Theorem works.

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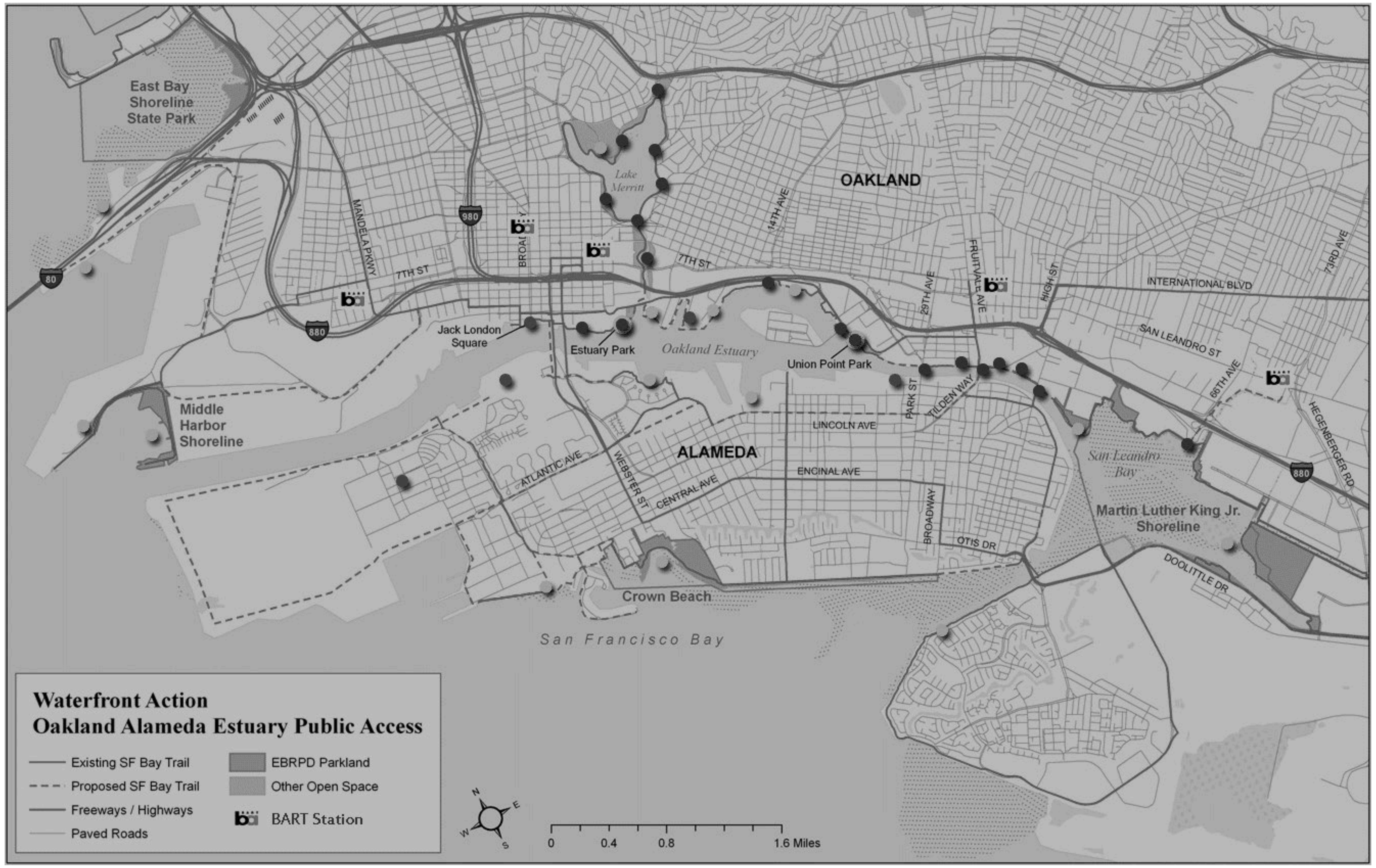

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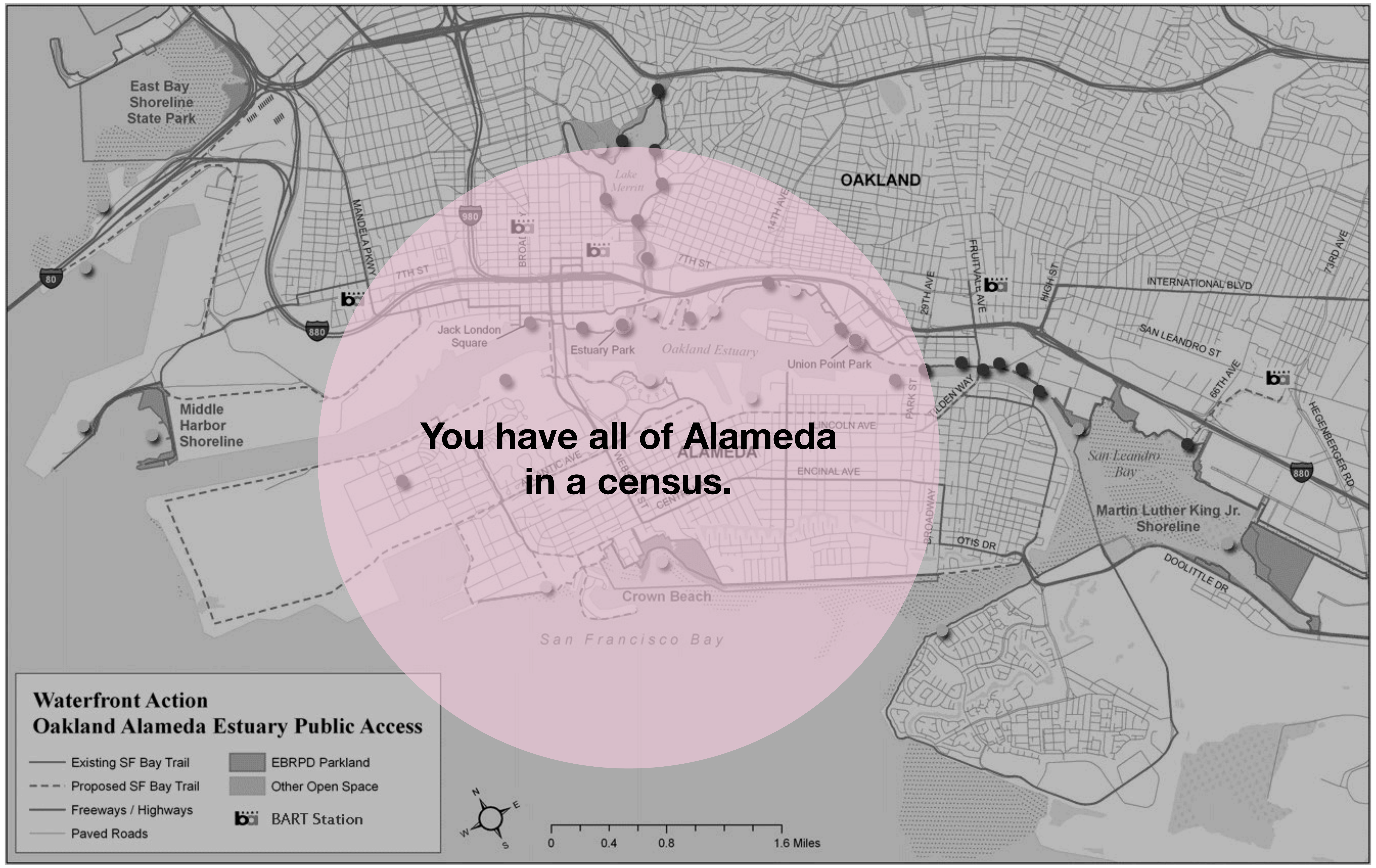

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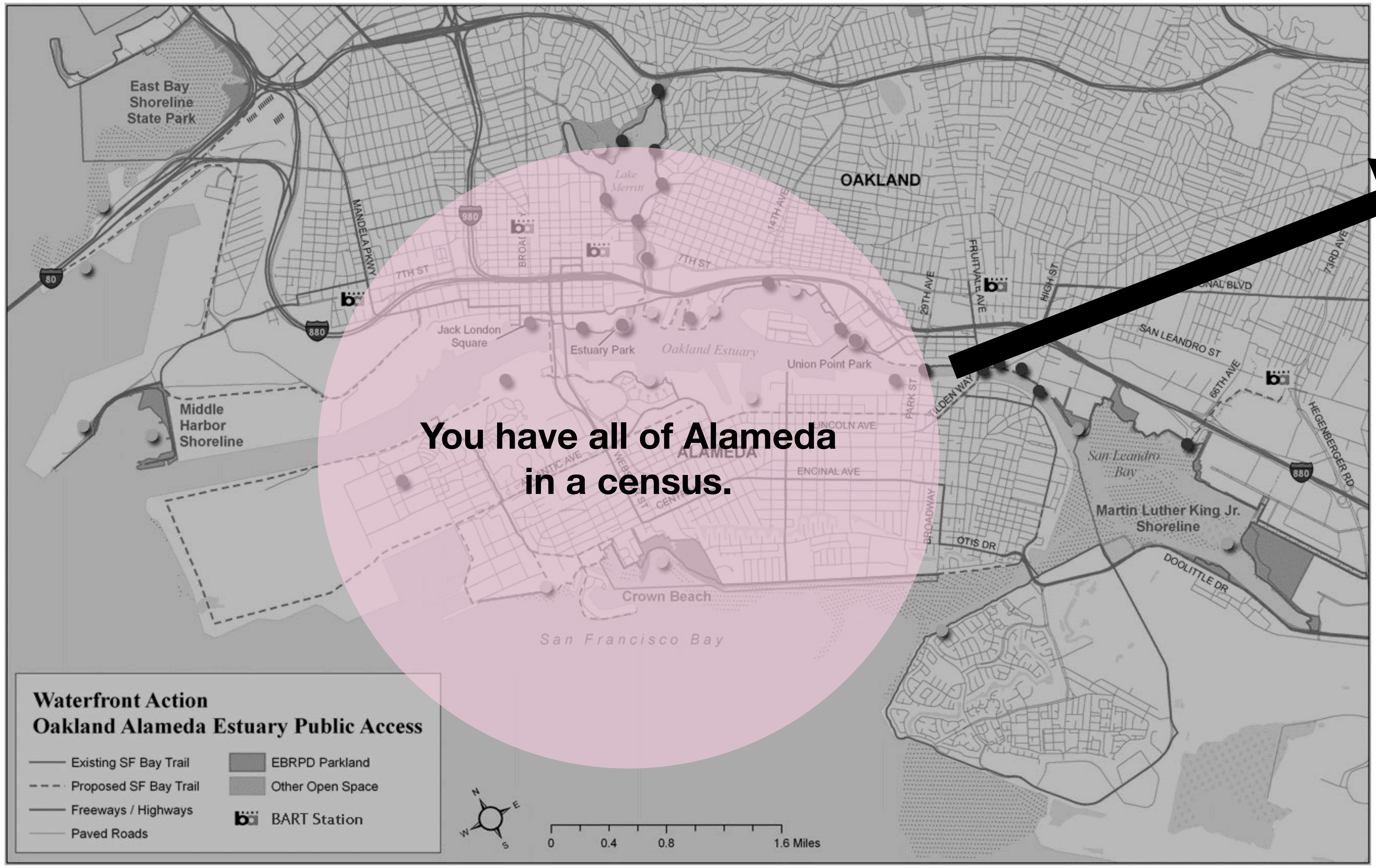

Here's a sample of size n.

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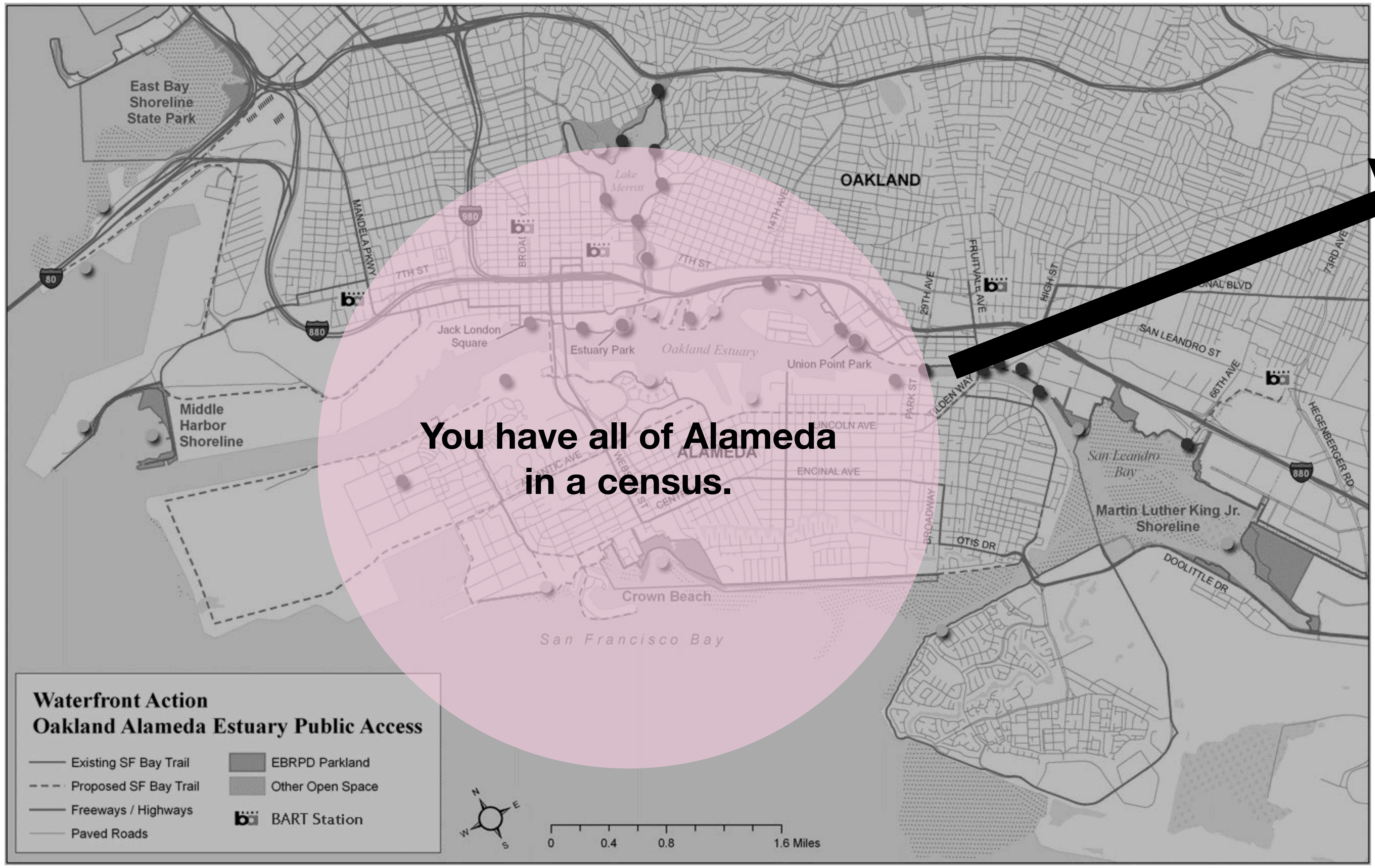

Here's a sample of size n.

You can take a sample statistic to approximate the population parameter.

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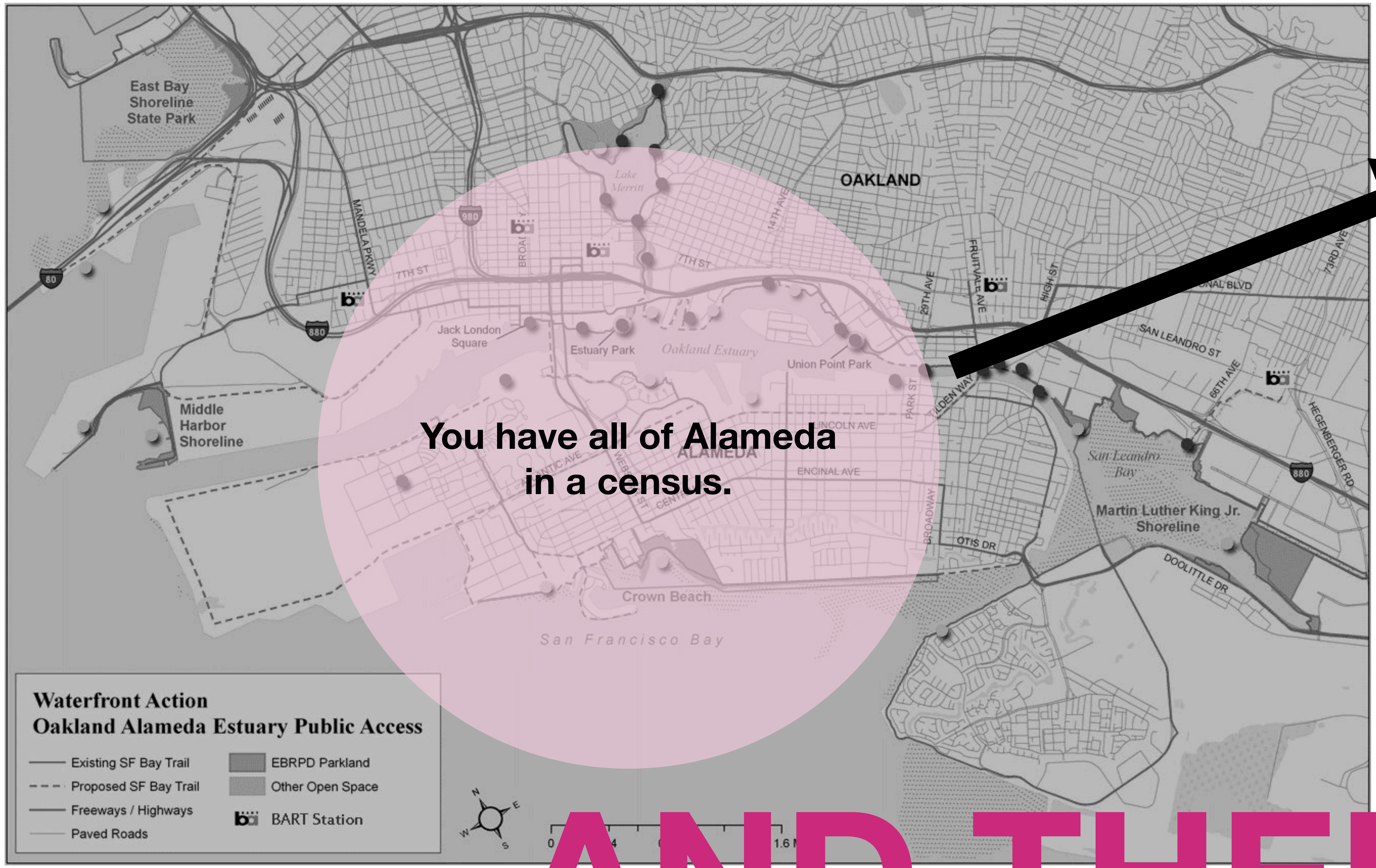


You have all of Alameda in a census.

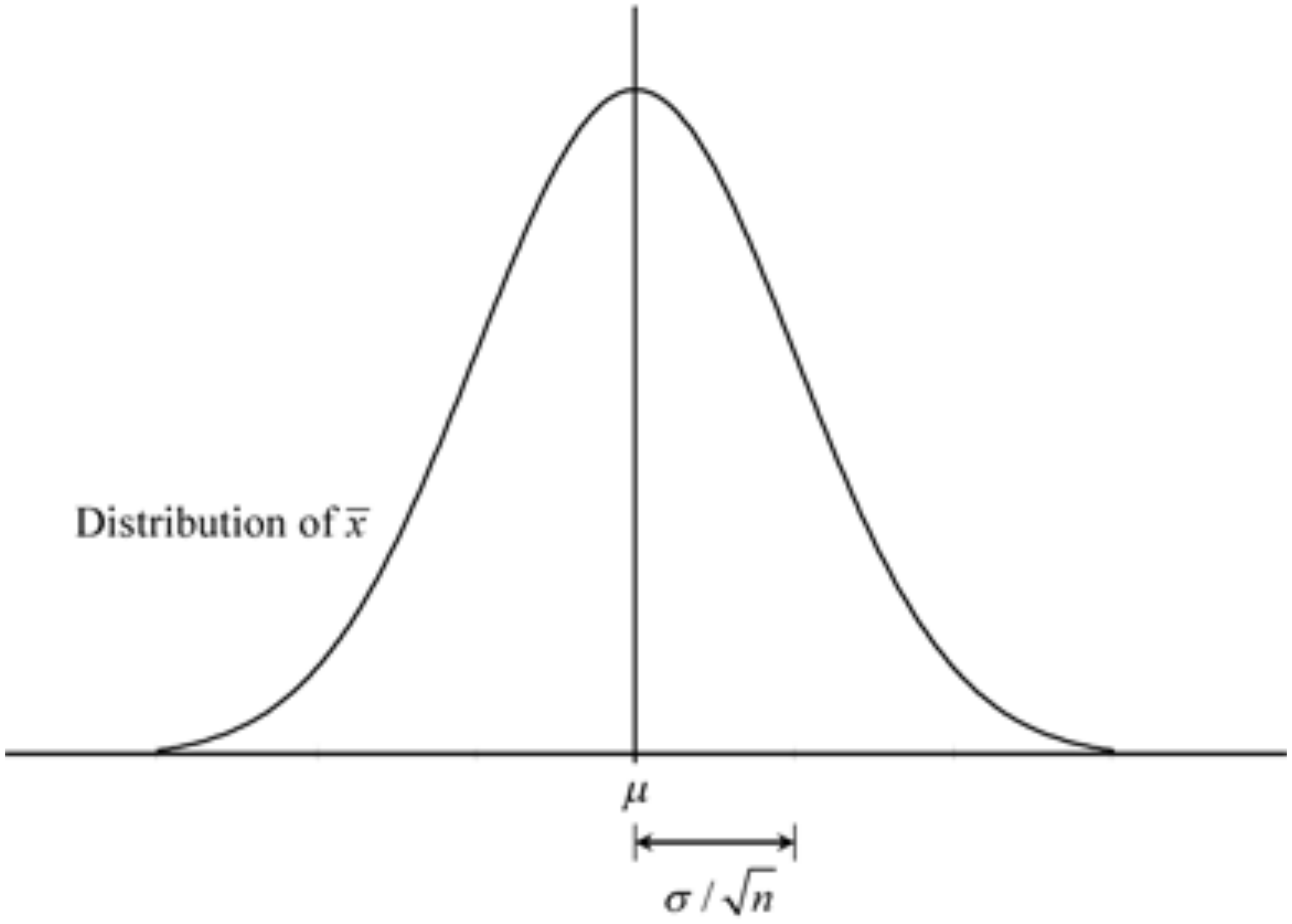
Here's a sample of size n.

You can take a sample statistic to approximate the population parameter.

AND THEN REPEAT

Lab 6

When you repeat many times, you create a sampling distribution.



Lab 6

We can also make a sampling distribution for proportion.
Notice… we're verging on confidence intervals. (Next up!)