# 190F Foundations of Data Science

Spring 2020

# Lecture 12

Midterm Exam Review

# Midterm

- Covers lecture 1-9, labs 1-5, HW 1-5
- TONIGHT, 7-9pm in 0221 ISB
- Don’t need to bring anything except a pencil

# Next week

- Lab 6 on Monday about hypothesis testing
- Lecture Tuesday on Confidence Intervals (Ch 13)
- HW 6 assigned Tuesday (due after break)

# Histograms

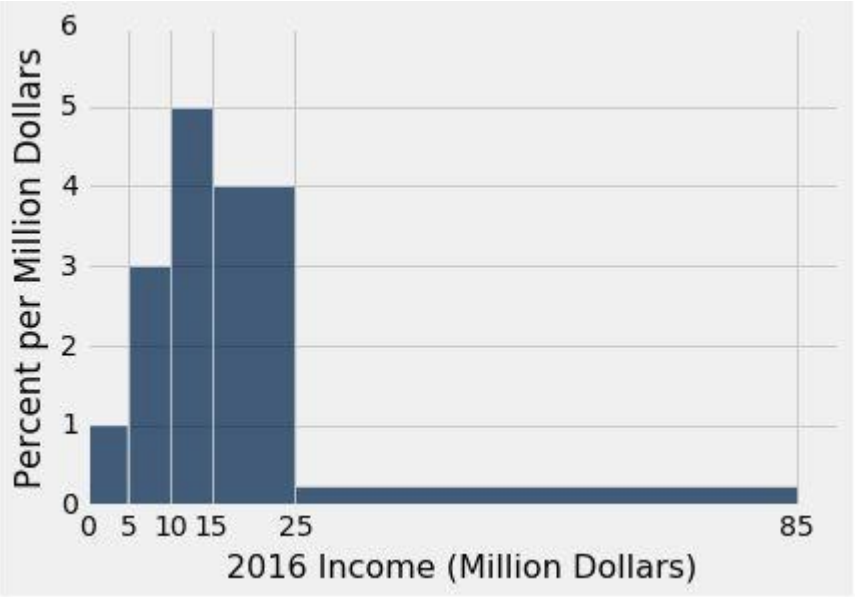
# Using the Density Scale

1. Which bin has more people: [10, 15) or [15, 25)?

2. What percent of incomes are in the [25,85) bin?

3. If you draw one bar over [10,25), how tall will it be?

4. Find (or give bounds for) the median income.



# Answers

(a) [15, 25)

(b) 15%

(c) 4.33 percent per million dollars

(d) At least 15 and less than 25

# Probability

# Exercise 1

I pick one of the 12 months at random. Independently, you pick one of the 12 months at random.

What is the chance that we both pick the same month?

(i) (1/12) * (1/12)  (ii) (1/12) + (1/12)  (iii) 1/12

**(iii)** = (12/12) * (1/12)

# Exercise 2

Marbles: G, G, G, G, R, R, R, B, B, Y. Draw 4 at random.

P(no G) = ?

P(all G) = ?

# Exercise 2

Marbles: G, G, G, G, R, R, R, B, B, Y. Draw 4 at random.

P(no G) = ?

If with replacement:
(6/10)*(6/10)*(6/10)*(6/10)

If without replacement:
(6/10)*(5/9)*(4/8)*(3/7)

P(all G) = ?

If with replacement:
(4/10)*(4/10)*(4/10)*(4/10)

If without replacement:
(4/10)*(3/9)*(2/8)*(1/7)

# Exercise 3

Marbles: G, G, G, G, R, R, R, B, B, Y. Draw 4 times at random with replacement.

1 - (6/10)*(6/10)*(6/10)*(6/10) is the chance of:

at least one G

(4/10)**4 + (3/10)**4 + (2/10)**4 + (1/10)**4 is the chance of:

all four are the same color

# Some python commands to think about

*Try to write a correct expression using the following:*

max/min/sum

take

where

sample

# Q&A