

# STT 200 – LECTURE 1, SECTION 2,4 RECITATION 5 (10/2/2012)

TA: Zhen (Alan) Zhang

[zhangz19@stt.msu.edu](mailto:zhangz19@stt.msu.edu)

Office hour: (C500 WH) 1:45 – 2:45PM Tuesday  
(office tel.: 432-3342)

Help-room: (A102 WH) 11:20AM-12:30PM, Monday, Friday

Class meet on Tuesday:

**3:00 – 3:50PM** A122 WH, Section **02**

**12:40 – 1:30PM** A322 WH, Section **04**

# OVERVIEW

- We will discuss following problems:
  - Chapter 7 “*The standard deviation as a rule and the normal model*” (Page 186): #1, 3, 4, 6
  - Chapter 6 “*The standard deviation as a rule and the normal model*” (Page 148): #52
- All recitation PowerPoint slides available at [here](#)



- Chapter 7 (Page 186): #1:


Association: which response variable, which explanatory variable? What expect to see the scatterplot? Direction, form and strength.

- Apple: weight (gram) and weight (ounces)
- Apple: circumference (inch), weight (ounces)
- College freshmen: shoe size, GPA
- Gasoline: # of miles you drove since filling up, gallons remaining in your tank.



- Chapter 7 (Page 186): #1 (continued):

X denotes explanatory variable and Y denotes response variable. Reason will be “to predict Y based on X”.

- Apple: weight (gram)[X] and weight[Y] (ounces), exchangeable. Positive, straight, strong (perfect linear)
  - Apple: circumference[X] (inch), weight[Y] (ounces): positive, linear, moderately strong.
  - College freshmen: shoe size[X], GPA[Y]. No direction, no form, very weak.
  - Gasoline: # of miles you drove since filling up[X], gallons remaining in your tank[Y]. Negative, straight, moderate.
- 

- Chapter 7 (Page 186): #3:

Association: which response variable, which explanatory variable? What expect to see the scatterplot? Direction, form and strength.

- When climbing a mountain: altitude, temperature.
- For each week: ice cream cone sales, air-conditional sales.
- People: age, grip strength
- Drivers: blood alcohol level, reaction time.



- Chapter 7 (Page 186): #3 (continued):

X denotes explanatory variable and Y denotes response variable.

Reason will be “to predict Y based on X”.

- When climbing a mountain: altitude[X], temperature[Y]: negative, possibly straight, weak to moderate.
- For each week: ice cream cone sales[X], air-conditional sales[Y]. The other direction works as well: positive, straight, moderate.
- People: age[X], grip strength[Y]: curved down, moderate, very young and elderly would have grip strength less than that of adults.
- Drivers: blood alcohol level[Y], reaction time[X]. The other direction is possible: positive, nonlinear, moderately strong.



- Chapter 7 (Page 186): #4:

Association: which response variable, which explanatory variable? What expect to see the scatterplot? Direction, form and strength.

- Long-distance calls: time (minutes), cost
- Lighting strikes: distance from lighting, time delay of the thunder.
- A streetlight: its apparent brightness, your distance from it.
- Cars: weight of car, age of owner



- Chapter 7 (Page 186): #4 (continued):

X denotes explanatory variable and Y denotes response variable. Reason will be “to predict Y based on X”.

- Long-distance calls: time (minutes)[X], cost[Y]: positive, straight, strong.
- Lighting strikes: distance from lighting[Y], time delay of the thunder[X]: positive, straight, strong.
- A streetlight: its apparent brightness[X], your distance from it[Y] : negative, curved, moderate.
- Cars: weight of car[X], age of owner[Y]: no direction, no shape, very weak.



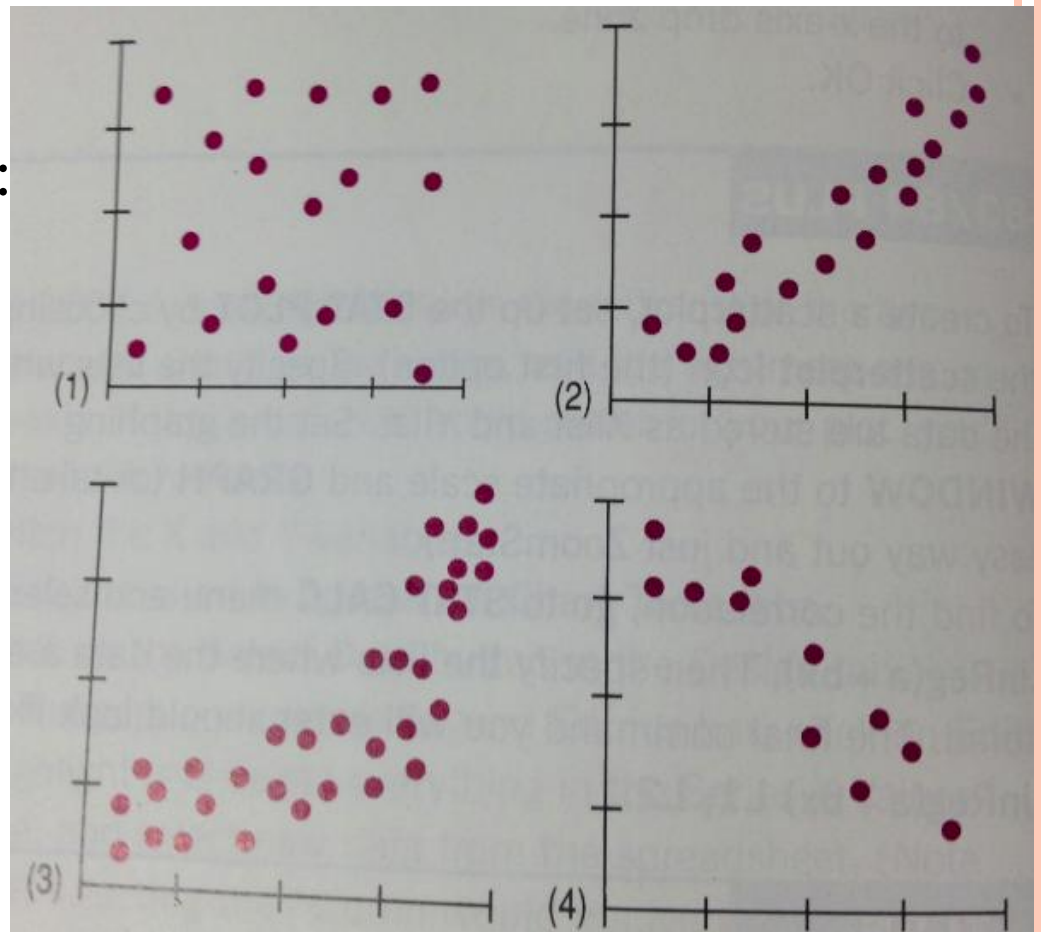


○ Chapter 7 (Page 186): #6:

Which of the scatterplots

Show

- Little or no association?
- A negative association?
- A linear association?
- A moderately strong association?
- A very strong association?



○ Chapter 7 (Page 186): #6 (continued):

Which of the scatterplots show

- Little or no association? (1)
- A negative association? (4)
- A linear association? (2) and (4)
- A moderately strong association? (3)
- A very strong association? (2) and (4)



- Chapter 6 (Page 152): #52:

Normal with mean 32,000, standard deviation 2500, unit: mile.

- Reasonable for 40,000 miles?
- Fraction of those less than 30,000 miles?
- Fraction of those between 30,000 and 35,000 miles?
- IQR?
- Refund to no more than 1 of 25 customers, what mileage can be guaranteed to last?



○ Chapter 6 (Page 152): #52 (continued):

Normal with mean 32,000, standard deviation 2500, unit: mile.

- Reasonable for 40,000 miles? (No, more than 3 SDs above the mean)
- Fraction of those less than 30,000 miles? (21.2%)
- Fraction of those between 30,000 and 35,000 miles? (67.3%)
- IQR? (30,314 and 33,686 miles, so 3372 miles.)
- Refund to no more than 1 of 25 customers, what mileage can be guaranteed to last? ( $1/25 = 0.04$ , calculate using  $\text{invNorm}(0.04, 32000, 2500) = 27623$  miles.)

