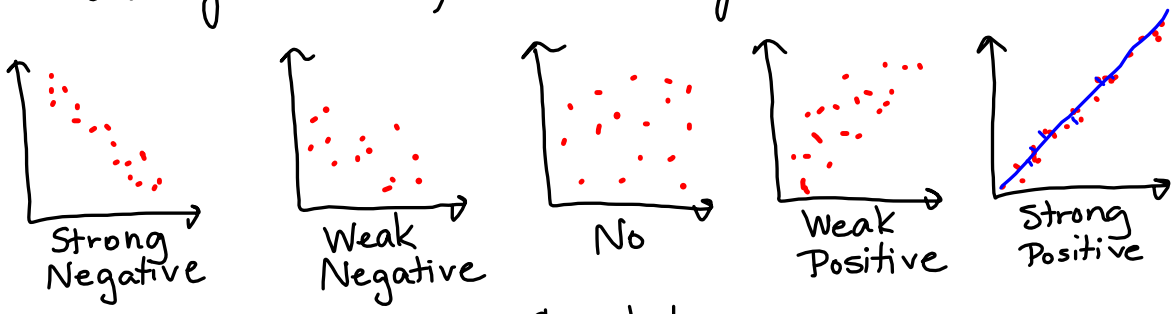
Sec. 2.5 Using Linear Models

Vocabulary

- scatter plot: graph that relates two sets of data by plotting the data as ordered pairs
- correlation: strength of the relationship between data sets; the closer the data falls along a line, the stronger the correlation



Correlation

- correlation coefficient, r

$$-1 \leq r \leq 1$$

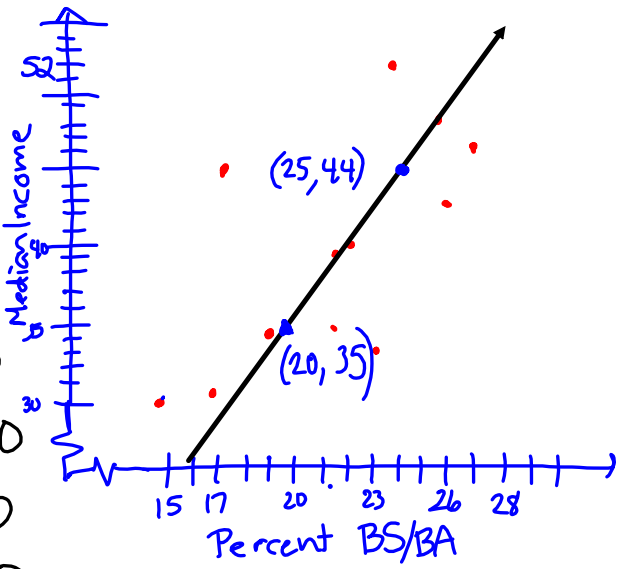
(SN at -1, SP at 1)

- line of best fit: the trend line that gives the most accurate model of related data

Problem 1:

State	Adults with at Least BS/BA	Median HH Income
AK	25%	$52,000
AL	19%	$34,000
CA	27%	$47,000
FL	22%	$39,000
MS	17%	$31,000
MT	24%	$33,000
ND	22%	$35,000
NY	27%	$43,000
NV	18%	$45,000
TX	23%	$40,000
WA	28%	$46,000
WV	15%	$30,000

① Scatter Plot



② Trend Line
- Two points
  - Find Slope
  - Find Line

(20,35) (25,44)

$m = \frac{44-35}{25-20} = \frac{9}{5}$

$y-35 = \frac{9}{5}(x-20)$

$y-35 = \frac{9}{5}x-36$

$+35 \qquad +35$

$y = \frac{9}{5}x-1$

If a state had 50% BA/BS, what would its income be?

$y = \frac{9}{5}(50)-1$

$90-1$

$\$89,000$

Problem 2:

	Year	Avg. Cost Movie Tickets
L1		L2
0	1995	4.35
2	1997	4.59
4	1999	5.06
6	2001	5.65
8	2003	6.03
10	2005	6.41
12	2007	6.88

On

STAT (EDIT)

Enter

L1	L2	L3

L1L2

STAT

→ CALC

4 LinReg (ax + b)

Xlist: L_1

Ylist: L_2

CALCULATE

$y = ax + b$

$a = 0.2178571429$

$b = 4.26$

2nd

MEM

7 Reset

1 All

2 Reset

x = years since 1995

$y = 0.22x + 4.26$

Cost in 2016?

$x = 21$

$y = 8.88$