4-6 Notes: Regression and Median-Fit Lines

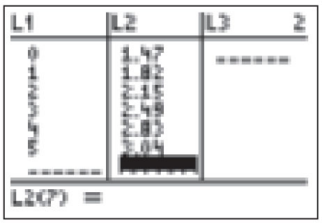
Equations of Best-Fit Lines

Example: GAS PRICES The table shows the price of a gallon of regular gasoline at a station in Los Angeles, California on January 1 of various years.

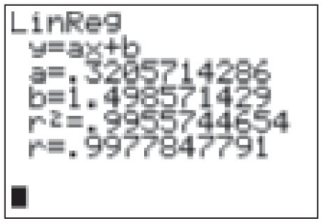
Year	2005	2006	2007	2008	2009	2010
Average Price	$1.47	$1.82	$2.15	$2.49	$2.83	$3.04

Source: U.S. Department of Energy

a. Use a graphing calculator to write an equation for the best-fit line for that data. STAT



b. Name the correlation coefficient.



Exercises

Write an equation of the regression line for the data in each table below. Then find the correlation coefficient.

1. OLYMPICS Below is a table showing the number of gold medals won by the United States at the Winter Olympics during various years.

Year	1992	1994	1998	2002	2006	2010
Gold Medals	5	6	6	10	9	9

Source: International Olympic Committee

2. INTEREST RATES Below is a table showing the U.S. Federal Reserve's prime interest rate on January 1 of various years.

Year	2006	2007	2008	2009	2010
Prime Rate (percent)	7.25	8.25	7.25	3.25	3.25

Source: Federal Reserve Board

Regression and Median-Fit Lines

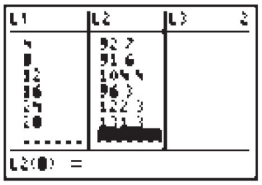
Equations of Median-Fit Lines

Example: ELECTIONS The table shows the total number of people in millions who voted in the U.S. Presidential election in the given years.

Year	1980	1984	1988	1992	1996	2004	2008
Voters	86.5	92.7	91.6	104.4	96.3	122.3	131.3

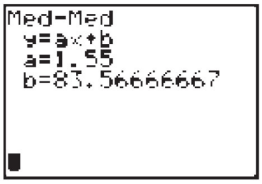
Source: George Mason University

a. Find an equation for the median-fit line.



b. Estimate the number of people who voted in the 2000 U.S. Presidential election.

TRACE



Exercises

Write an equation of the regression line for the data in each table below. Then find the correlation coefficient.

1. **POPULATION GROWTH** Below is a table showing the estimated population of Arizona in millions on July 1st of various years.

Year	2001	2002	2003	2004	2005	2006
Population	5.30	5.44	5.58	5.74	5.94	6.17

Source: U.S. Census Bureau

a. Find an equation for the median-fit line.

b. Predict the population of Arizona in 2009.

2. **ENROLLMENT** Below is a table showing the number of students enrolled at Happy Days Preschool in the given years.

Year	2002	2004	2006	2008	2010
Students	130	168	184	201	234

a. Find an equation for the median-fit line

b. Estimate how many students were enrolled in 2007.