

Linear Regression Practice

1. The table below shows the percent of persons below the poverty level in the selected years. Let $x = 0$ correspond to 1980.

Year	1980	1985	1990	1991	1992	1993	1994	1995
Percent	13	14	13.5	14.2	14.8	15.1	14.5	13.8

- Create a scatter plot of the data.
- Do you think that this data has a negative or positive correlation?
- Find the least squares regression line that models this data.
- Is this an exact model or an approximate model?
- Estimate the percent of persons that are below the poverty level in 2000. Is this an example of interpolation or extrapolation?
- Estimate the percent of persons that are below the poverty level in 1989. Is this an example of interpolation or extrapolation?

2. The table shows the number of deaths per 100,000 people from heart disease.

Year	1950	1960	1970	1980	1990	1996
Deaths	510.8	521.8	496.0	436.4	368.3	358.6

- a. Create a scatter plot of the data.
- b. Do you think that this data has a negative or positive correlation?
- c. Find the least squares regression line that models this data.
- d. Is this an exact model or an approximate model?
- e. Estimate the number of deaths due to hear disease in 2008. Is this an example of interpolation or extrapolation?
- f. Estimate the number of deaths due to hear disease in 1974. Is this an example of interpolation or extrapolation?
- g. In the unlikely event that the linear model remains valid for far into the future, will there be a time when death from heart disease had been completely eliminated? If so when will this occur?
- h. Interpret the slope.

3. The table describes the average number of takeout meals annually for the given years.

Year	Average Number of Takeout Meals Annually
1984	43
1986	48
1988	53
1990	55
1992	57
1994	61
1996	65

- Make a scatter plot of the data letting $x = 0$ represent 1984.
- Find the least squares regression line.
- According to your model, what was the average number of take-out meals purchased in 1993 and in 2000?
- If your model remains valid far into the future, when will the annual number of take-out meals reach 70?
- Interpret the slope