

9. Harry Potter Listed below are the amounts (millions of dollars) grossed during the first three weeks of the movie *Harry Potter and the Half Blood Prince*. Use the best model to predict the gross amount on the 22nd day of the movie's release. Is the result close to the actual amount of \$2.2 million? Is there any characteristic of the data not revealed by the model? (Hint: The movie opened on a Wednesday.)

58.2 22.0 26.8 29.2 21.8 9.9 9.5 7.5 6.9 9.3
11.2 8.9 4.0 4.0 4.6 3.8 5.4 6.8 5.8 2.5 2.4

10. Deaths from Motor Vehicle Crashes Listed below are the numbers of deaths in the United States resulting from motor vehicle crashes. Use the best model to find the projected number of such deaths for the year 2020.

Year	1975	1980	1985	1990	1995	2000	2005	2010
Deaths	44,525	51,091	43,825	44,599	41,817	41,945	43,443	32,708

11. Richter Scale The table lists different amounts (metric tons) of the explosive TNT and the corresponding value on the Richter scale used for explosions of the TNT.

TNT	2	10	15	50	100	500
Richter Scale	3.4	3.9	4.0	4.4	4.6	5.0

12. Benford's Law According to Benford's law, a variety of different data sets include numbers with leading (first) digits that occur with the proportions listed in the following table.

Leading Digit	1	2	3	4	5	6	7	8	9
Proportion	0.301	0.176	0.125	0.097	0.079	0.067	0.058	0.051	0.046

13. Bacteria Growth In a carefully controlled experiment, bacteria are allowed to grow for a week. The number of bacteria are recorded at the end of each day with these results: 20, 40, 80, 160, 320, 640, 1280.

14. Sunspot Numbers Listed below in order by row are annual sunspot numbers beginning with 1980. Is the best model a good model? Carefully examine the scatterplot and identify the pattern of the points. Which of the models fits that pattern?

154.6 140.5 115.9 66.6 45.9 17.9 13.4 29.2 100.2 157.6
142.6 145.7 94.3 54.6 29.9 17.5 8.6 21.5 64.3 93.3
119.6 123.3 123.3 65.9 40.4 29.8 15.2 7.5 2.9 3.1 16.5

15. Stock Market Listed below in order by row are the annual high values of the Dow Jones Industrial Average for each year beginning with 1990. Use only the first 10 values (for 1990–1999) to find the best model and then predict the value for the year 2010. Is the predicted value close to the actual value of 11,655?

3000 3169 3413 3794 3978 5216 6561 8259 9374 11,568
11,401 11,350 10,635 10,454 10,855 10,941 12,464 14,198 13,338 10,606

16. Stock Market Repeat the preceding exercise using all of the data values.

10-6 Beyond the Basics

17. Moore's Law In 1965, Intel cofounder Gordon Moore initiated what has since become known as *Moore's law*: the number of transistors per square inch on integrated circuits will