Exercises for Lecture 7, Stat 112, Fall 2002


Manatees are large, gentle sea creatures that live along the Florida coast. Many manatees are killed or injured by powerboats. The data set manatee.jmp gives data on powerboat registrations (in thousands) and the number of manatees killed by boats in Florida in the years 1977 to 1990.

(a) Make a scatterplot of these data. Describe the form and direction of the relationship.

(b) Find the correlation. What fraction of the variation in manatee deaths can be explained by the number of boats registered? Does it appear that the number of manatees killed can be predicted accurately from powerboat registrations?

(c) Find the least squares regression line. Predict the number of manatees that will be killed by boats in a year when 716,000 powerboats are registered.

(d) Suppose that in some far future year 2 million powerboats are registered in Florida. Use the regression line to predict manatees killed. Explain why this prediction is unreliable.

(e) Here are four more years of manatee data: Add these points to your scatterplot. Florida took stronger measures to protect manatees during these years. Do you see any evidence that these measures succeeded?

(f) In part (c) you predicted manatee deaths in a year with 716,000 powerboat registrations. In fact, powerboat registrations remained at 716,000 for the next three years. Compare the mean manatee deaths in these years with your prediction from part (c). How accurate was your prediction?