

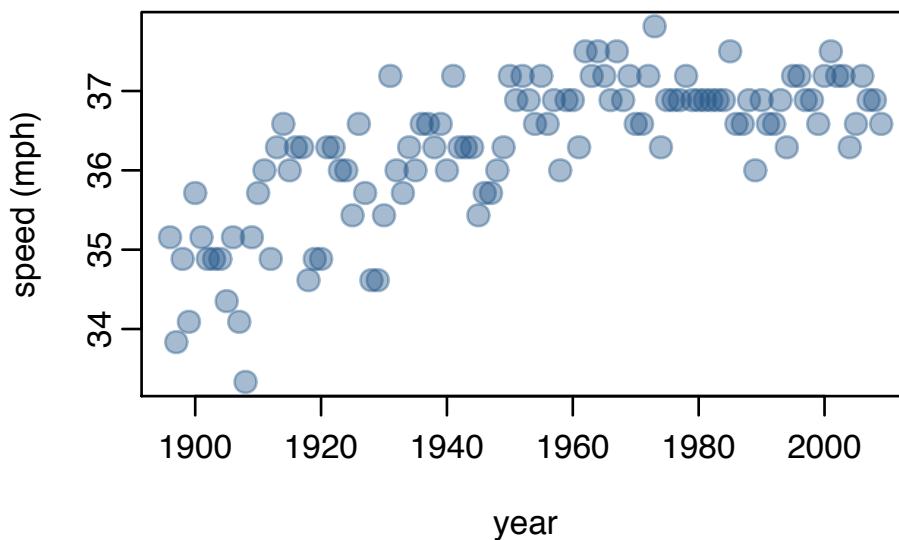
Section 2A Discussion
Dec 3rd, 2009

p614, #41

Psychology experiments sometimes involve testing the ability of rats to navigate mazes. The mazes are classified according to difficulty, as measured by the mean length of time it takes to find the food at the end. One researcher needs a maze that will take rats on average about one minute to solve. He tests one maze on several rats. This data appears to be about normally distributed with mean 52 seconds and standard deviation 14 for 21 rats. Test the hypothesis that the mean completion time is 60 seconds.

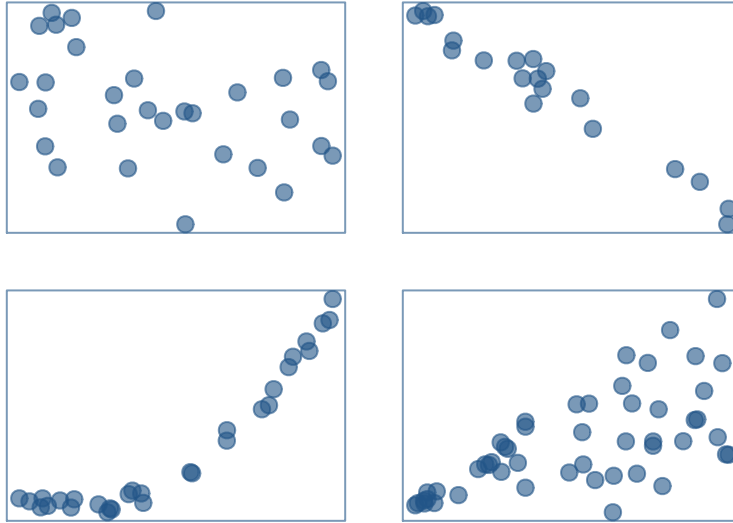
p187, #8

The fastest horse in the Kentucky Derby was Secretariat in 1973. The scatterplot shows speed (in miles per hour) of the winning horse each year. What do you see? In most sports, improvement occurs over time as more advanced training, nutritional, and (sometimes) illegal methods are used. Does it appear we can model the performance of horses with a linear model?



Not in book

Which of the following plots would be reasonable for a linear model? Which violate our assumptions? Match the following four correlations to the plots: 0.93, -0.98, -0.36, 0.65.



p217, #29

Is nicotine content of a cigarette related to the tar content? A sample of 29 cigarettes produced a positive relationship between nicotine and tar that appears to be linear. We fit a regression line and find

$$\widehat{nicotine} = 0.154 + 0.065 * (tar)$$

Our model gives $R^2 = 0.924$.

- Explain the meaning of R^2 .
- If we know another cigarette has tar content 0.5 (mg), what would you expect the nicotine content to be (approximately)?
- The cigarette in (b) had nicotine content 0.2065. Would this value fall above or below the regression line? Would its residual be positive or negative?