School of Public Health PHPM1100062

Mengcen Qian Spring 2017

Problem Set 1

Due on 03/20 (Week 4)

1. Suppose you’ve accepted a summer job as a weight guesser at the local amusement park, Magic Hill. Customers pay two dollars each, which you get to keep if you guess their weight within 10 pounds. If you miss by more than 10 pounds you have to return the two dollars and give the customer a small prize that you buy from Magic Hill for three dollars each. Luckily, the friendly managers of Magic Hill have arranged a number of marks on the wall behind the customer so that you are capable of measuring the customer’s height accurately. To have a better performance, you decide to collect data to run a regression to estimate the relationship between weight and height. Since most of the participants are male, you decide to limit your sample to males. Finally, you obtain the following estimated regression line

Estimated weight = 103.40 + 6.38\*Height (inches above 5 feet)

Measure the height of a male friend and plug it into the above equation. Does the equation come within 10 pounds? If not, do you think you see why? Why does the estimated equation predict the same weight for all males of the same height when it is obvious that all males of the same height don’t weight the same?

1. A soda vendor at Fudan University football games observes that more sodas are sold the warmer the temperature at game time. Based on 32 home games covering 5 years, the vendor estimates the relationship between soda sales and temperature to be ŷ=-240+6x, where y=the number of sodas she sells and x=temperature in degrees Fahrenheit.
2. Interpret the estimated slope and intercept. Do the estimates make sense? Why or why not?
3. On a day when the temperature at game time is forecast to be 80 oF, predict how many sodas the vendor will sell.
4. Please use your own words to explain the difference between an **estimator** and **estimate**.