Estimation

Exercise 1

Weights (in kgs) of a random sample of marathon participants are as follows:

56, 85, 82, 74, 68, 75, 82, 73, 58, 64, 60

Estimate average weight of all participants. Knowing that standard deviation of weight for all participants is equal to 8, calculate standard error of the estimate.

Exercise 2

How does the answer to exercise 1 change if standard deviation for all participants is not known?

Exercise 3

A random sample of number of hours worked by an HR staff weekly is as follows:

38, 45, 35, 42, 37, 38, 45, 35, 35, 40

Estimate the variance of number of hours worked by HR staff.

Exercise 4

Waiting time in a medical office (in mins) of randomly chosen customers are as follows:

25, 22, 19, 30, 15, 10, 19, 5, 16, 10, 14, 8, 5

Estimate average waiting time and calculate standard error of the estimate.

How large should the sample be if we want the standard error to be less than 1 minute?

Exercise 5

A random sample of 540 construction workers showed that 57 are currently unemployed. Estimate proportion of all construction workers who are unemployed and calculate standard error of the estimate.

Exercise 6

A random sample of results of a certain football team are as follows:

win, loss, win, win, loss, loss, win, loss, win, win, win, loss, win, loss, loss, win, win

Estimate proportion of all game that were won and calculate standard error of the estimate.

How large should the sample be if we want the standard error to be less than 0.1?

Exercise 7

Using data from exercise 1 calculate 99% confidence interval for average weight of all participants

Exercise 8

Redo exercise 7 assuming standard deviation for the population is unknown

Exercise 9

Using data from exercise 4 calculate confidence interval for average waiting time using confidence level:

1. 99%
2. 95%
3. 90%

Exercise 10

Using data from exercise 5 calculate confidence interval for proportion of all construction workers who are unemployed using confidence level:

1. 95%
2. 99%