Assignment 1

Exercise 1

Suppose you have two factories producing juice containers. The average weight of containers in Factory 1 is 60 kg, while in Factory 2, it is 58 kg. We randomly selected a sample of 10 containers from Factory 1 and 12 containers from Factory 2. Assuming weights follow a normal distribution, calculate the probability that the average weight of containers in the sample from Factory 1 is greater than that from Factory 2 by 1.5 kg, given that the standard deviations of the samples are 1.2 kg and 1.3 kg, respectively.

Exercise 2

You have two factories producing milk containers. Factory 1 has an average container weight of 70 kg, while Factory 2 has an average weight of 68 kg. A random sample of 15 containers was taken from Factory 1 and a sample of 10 containers from Factory 2. If weights follow a normal distribution, calculate the probability that the average weight of containers in the sample from Factory 1 is less than that of Factory 2 by 1 kg, given that the standard deviations of the samples are 2 kg and 1.8 kg, respectively.

Exercise 3

In two coffee container factories, Factory 1 has an average container weight of 65 kg, and Factory 2 has an average of 63 kg. We sampled 20 containers from Factory 1 and 18 from Factory 2, assuming the weights follow a normal distribution. Calculate the probability that the average weight of containers in the sample from Factory 1 is greater than that in Factory 2 by 0.75 kg, given that the standard deviations for each sample are 1.6 kg and 1.5 kg, respectively.