Problem 1

Suppose a project manager of an engineering design firm bids on three projects. The chance that a bid will be accepted is:

$$\Pr(A) = 0.7\,, \Pr(B) = 0.6, \Pr(C) = 0.4$$

We can reasonably assume that three bids are *independent*.

(1) Find $\Pr(A \cap B \cap C^c)$.

(2) What is the probability that exactly two of three bids are accepted?

Problem 2

Let $X \sim N(1, 4)$.

(1) Find Pr $(0 < X < 3)$.

(2) Let X_1, X_2, X_3, and X_4 is a random sample from $N(1,4)$. Find the probability that exactly one of X_1, X_2, X_3, and X_4 is between 0 and 3.

Problem 3

A manufacturer of watches has established that on average his watches do not gain or lose. He also would like to claim that at least 95% of the watches are accurate to ±0.2 s per week. A random sample of 15 watches provided the following gains (+) or losses (−) in seconds in one week:

+0.17 -0.07 +0.13 +0.05 +0.23 +0.01 +0.06 +0.08

+0.14 +0.10 +0.08 +0.11 +0.05 -0.87 +0.05

Can the claims be made with a 5% chance of being wrong? You can assume that the inaccuracies of these watches are normally distributed.

Note: There are two claims from the manufacturer.

The sample mean is: 0.02133; the sample standard deviation is: 0.25626

Perform two tests of hypothesis with the rejection region approach. Then calculate the p-value and construct the appropriate CI. Check if the assumptions for those tests are satisfied.