

Exercise 08 – December 18, 2025 – January 08, 2026

1. Construct a Box Plot

The following dataset shows the scores of 12 students on a quiz:

Dataset:

45, 50, 52, 55, 60, 62, 65, 68, 70, 72, 75, 80

Tasks:

- Determine the five-number summary (minimum, 25th Quartile, 50th Quartile, 75th Quartile, maximum).
 - Draw the box plot based on the five-number summary with whiskers (use $1.5 * H$ -spread to identify outliers for step).
2. A teacher wants to select 4 students from a class of 10 students and then arrange them in order to present their project. How many different ordered presentation lines are possible?
3. A company wants to study how Training Program and Practice Duration affect employee performance scores.

Factor A (Training Program)

A1 = Standard and A2 = Intensive

Factor B (Practice Duration)

B1 = 1 hour, B2 = 2 hours, B3 = 3 hours and B4 = 4 hours

Each combination has $n = 3$ employees.

Performance scores are shown below.

| Training \ Practice | 1 h (B1) | 2 h (B2) | 3 h (B3) | 4 h (B4) |
|---------------------|------------|------------|------------|------------|
| Standard (A1) | 60, 62, 58 | 65, 66, 64 | 70, 72, 68 | 75, 77, 73 |
| Intensive (A2) | 65, 67, 63 | 72, 74, 70 | 78, 80, 76 | 85, 87, 83 |

Using $\alpha = 0.05$, perform a Two-Way ANOVA.

4. A company records the average delivery time for 36 packages as 48 minutes. The population standard deviation is $\sigma = 6$ minutes.
Construct a 99% confidence interval for the population mean delivery time.
5. A university investigates whether gender is associated with preference for online learning.
A survey of 120 students gives the following data:

| Gender | Prefer Online | Prefer Face-to-Face | Total |
|--------|---------------|---------------------|-------|
| Male | 35 | 25 | 60 |
| Female | 20 | 40 | 60 |
| Total | 55 | 65 | 120 |

Test at $\alpha = 0.05$ whether gender and learning preference are independent.