Hypothesis Testing Worksheet

Hypothesis Testing Using Excel (see below for LibreOffice)

Exercise 7.1

The mean number of items sold was significantly higher for Container Design 1 than Design 2.

The difference (13.2 items) is statistically significant at the 5% level (p = 0.0183).

Conclusion: Design 1 led to more sales and is likely the better option.

The INDEPENDENT Samples T Test

Exercise 7.2

Diet A leads to significantly more weight loss than Diet B.

The difference (1.631 kg) is statistically significant (p = 0.0028).

Conclusion: There is strong evidence to prefer Diet A for greater average weight loss.

Hypothesis Testing Using LibreOffice

Exercise 7.3

21.1% preferred Brand A

33.3% preferred Brand B

45.6% preferred Other brands

Interpretation:
Compared to Area 1 (from the worksheet), where 60% chose "Other", Area 2 has:
Higher preference for Brand B
Lower reliance on "Other" brands

This suggests demographic differences in brand choices — potentially useful for targeted marketing.

The One-Tailed Test

Exercise 7.4

Filter Agent 1 (mean = 5.341) is significantly more effective than Filter Agent 2 (mean = 3.710).

The result is statistically significant at the 5% level (p = 0.0014).

Conclusion: We have strong evidence to conclude that Filter Agent 1 is more effective.

The INDEPENDENT Samples T Test

Exercise 7.5

Male income is significantly higher than female income.

The test is statistically significant (p = 0.0014), with a mean difference of 1.631 units.

Conclusion: There is strong evidence to support the claim that males have a higher mean income than females in this dataset.