Unit 8 Inference Exercises – Solutions and Interpretation

Exercise 8.1B – Comparing Weight Loss: Diet A vs Diet B

Hypotheses:

H0: There is no difference in mean weight loss between Diet A and Diet B.

H1: There is a significant difference in mean weight loss between the two diets.

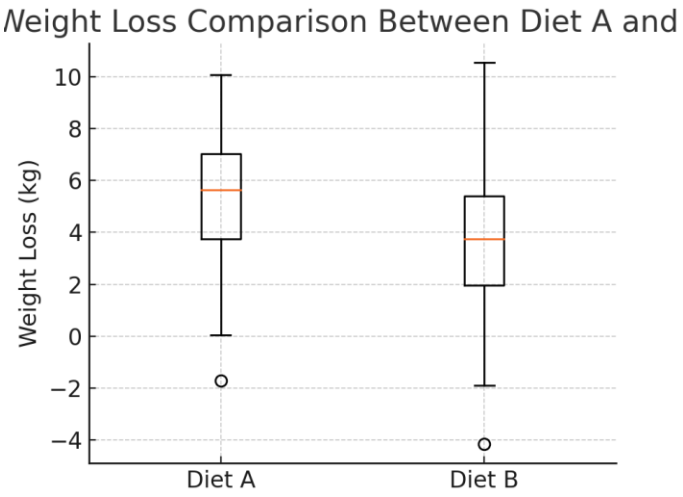
Significance level: α = 0.05

T-statistic = 3.0721

p-value = 0.0028

Decision: Reject the null hypothesis.

Interpretation: There is a statistically significant difference in mean weight loss between Diet A and Diet B.



Exercise 8.2B – Comparing Incomes: Male vs Female Superplus Cardholders

H0: There is no difference in mean income between male and female cardholders.

H1: There is a significant difference in mean income between male and female cardholders.

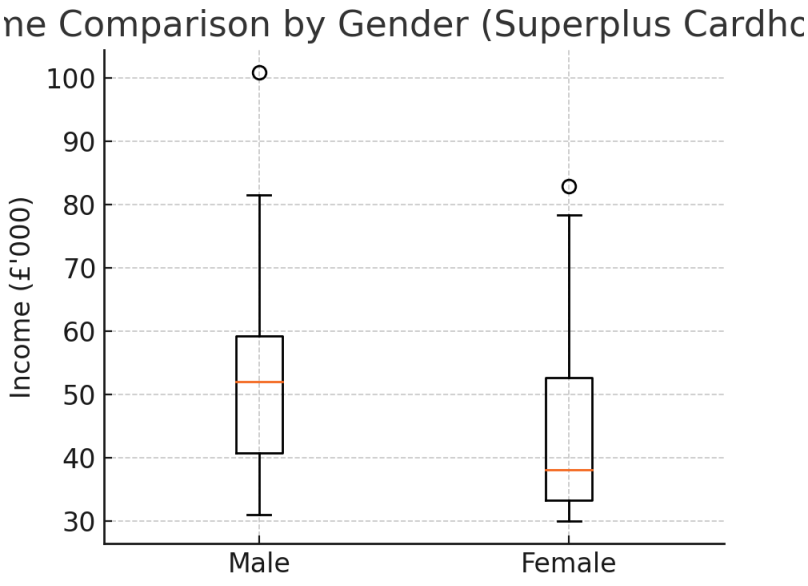
Significance level: α = 0.05

T-statistic = 3.2679

p-value = 0.0014

Decision: Reject the null hypothesis.

Interpretation: There is a statistically significant difference in income between male and female cardholders.



Exercise 8.3D – Brand Preference by Demographic Area

H0: Brand preference is independent of demographic area.

H1: Brand preference is associated with demographic area.

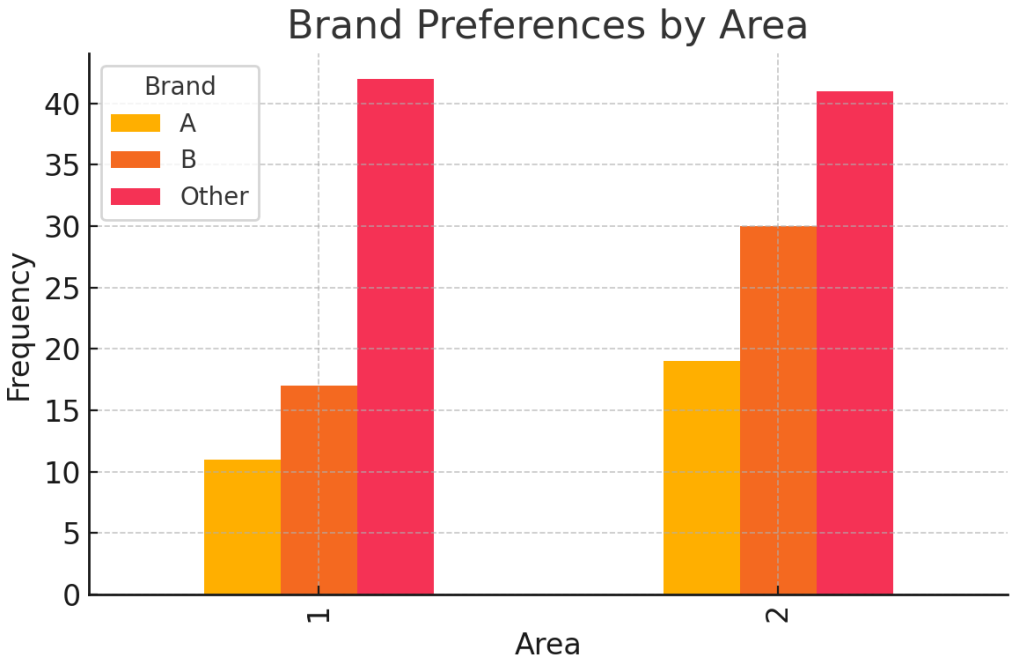
Significance level: α = 0.05

Chi-square statistic = 3.2926, Degrees of freedom = 2

p-value = 0.1928

Decision: Fail to reject the null hypothesis.

Interpretation: There is no statistically significant association between brand preference and demographic area.



Exercise 8.4G – Heather Prevalence by Location

H0: Heather prevalence is independent of location.

H1: Heather prevalence is associated with location.

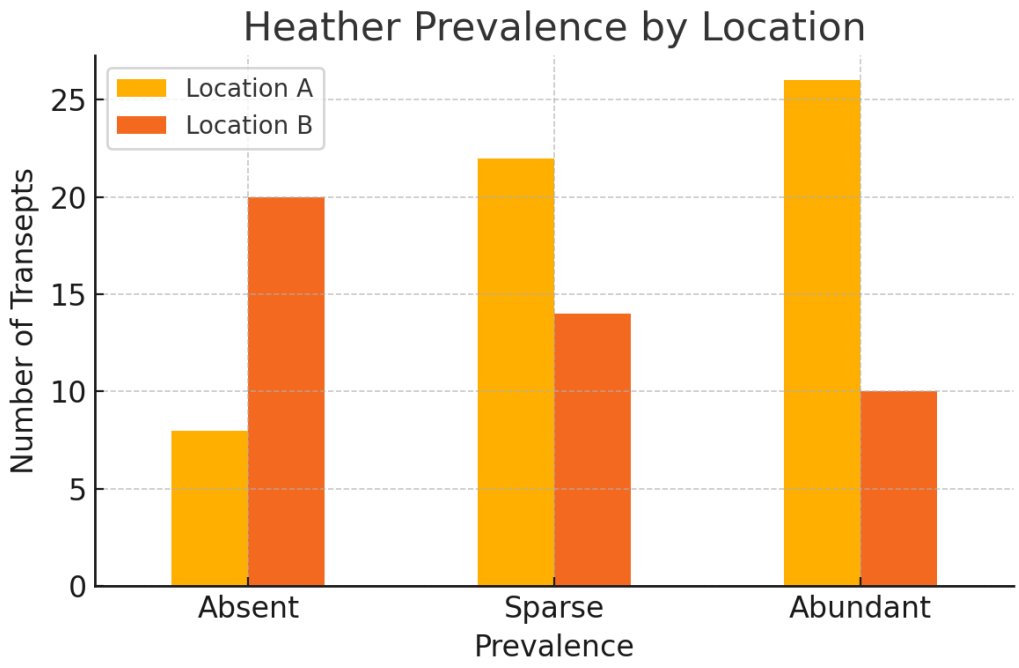
Significance level: α = 0.05

Chi-square statistic = 12.7757, Degrees of freedom = 2

p-value = 0.0017

Decision: Reject the null hypothesis.

Interpretation: There is a statistically significant association between heather prevalence and location.



Exercise 8.6C – Comparing Filtration Effectiveness of Two Agents

H0: There is no difference in mean impurity levels between Agent 1 and Agent 2.

H1: There is a significant difference in mean impurity levels between the two agents.

Significance level: α = 0.05

T-statistic = -3.2639

p-value = 0.0075

Decision: Reject the null hypothesis.

Interpretation: There is a statistically significant difference in filtration effectiveness between Agent 1 and Agent 2.