8.2

The t-test results compare the mean income between males and females.

Key findings:

Sample Means:

M=53,122

F=44,422

Sample Variances:

M= 234.49

F= 191.28

Sample Size:

59

Hypothesized Mean Difference:

The null hypothesis assumes no difference in mean income between males and females (μM= μF).

Calculated t-Statistic:

The t-statistic value is approximately 3.24.

P-Values:

One-Tail Test: The p-value is approximately 0.00078 (indicating statistical significance at a 5% level).

Two-Tail Test: The p-value is approximately 0.00157 (considering both directions).

Interpretation:

Since the p-value (0.00078) is significantly lower than 0.05, we reject the null hypothesis.

There’s strong evidence that the population mean income for males exceeds that of females based on this sample data.

8.3

Interpretation for the results of the paired two-sample t-test comparing the population means between two filtration agents.

Data Description:

The data consists of 12 batches, each tested with both Agent1 and Agent2.

The mean value for Agent1 is 7.5, and for Agent2 is 8.5.

The variance for both agents is approximately 0.98.

**T-Test Results:**

The t-statistic is -2.84, indicating that “Agent1” tends to have lower values than “Agent2.”

The p-value for a one-tailed test is 0.0087, suggesting statistical significance.

The degrees of freedom (df) are 11.

**Conclusion:**

Based on the p-value, we reject the null hypothesis that the means are equal.

There is evidence to suggest that the population mean differs between the two filtration agents.

8.5

The t-test results compare the mean income between males and females. Let’s break down the key findings:

Sample Means:

M=53,122

F=44,422

Sample Variances:

M= 234.49

F= 191.28

Sample Size:

59

Hypothesized Mean Difference:

The null hypothesis assumes no difference in mean income between males and females (μM= μF).

Calculated t-Statistic:

The t-statistic value is approximately 3.24.

P-Values:

One-Tail Test: The p-value is approximately 0.00078 (indicating statistical significance at a 5% level).

Two-Tail Test: The p-value is approximately 0.00157 (considering both directions).

Interpretation:

Since the p-value (0.00078) is significantly lower than 0.05, we reject the null hypothesis.

There’s strong evidence that the population mean income for males exceeds that of females based on this sample data.