|  |  |  |
| --- | --- | --- |
| **Confidence Intervals for Difference** | **Means: Population Variances Unknown and Assumed Equal** | **Means: Population Variances Unknown and Assumed Unequal** |
| Point Estimate |  |  |
| Confidence Level, C | The proportion of possible confidence intervals that contain the true value of their corresponding parameter.  The proportion of intervals that do not contain the true parameter, | The proportion of possible confidence intervals that contain the true value of their corresponding parameter.  The proportion of intervals that do not contain the true parameter, |
| Degrees of Freedom |  |  |
| Critical Value | Report and use the positive value. | Report and use the positive value. |
| Standard Error | Where, pooled variance, |  |
| Margin of Error |  |  |
| Lower Interval Bound |  |  |
| Upper Interval Bound |  |  |
| Conclusion | We are C% confident that the interval [lower, upper] contains the true <state the population parameter in terms of the data>. | We are C% confident that the interval [lower, upper] contains the true <state the population parameter in terms of the data>. |

| **Two Sample Hypothesis Testing** | **Means: Population Variances Unknown and Assumed Equal** | **Means: Population Variances Unknown and Assumed Unequal** |
| --- | --- | --- |
| Null and Alternative Hypotheses | **Two-Tailed** | **Two-Tailed** |
| **Left-Tailed** | **Left-Tailed** |
| **Right-Tailed** | **Right-Tailed** |
| Level of Significance | The probability of making an error, . | The probability of making an error, . |
| Degrees of Freedom |  |  |
| Critical Value | **Two-Tailed**  Report and use positive and negative. | **Two-Tailed**  Report and use positive and negative. |
| **Left-Tailed**  Report and use as is, the negative value. | **Left-Tailed**  Report and use as is, the negative value. |
| **Right-Tailed**  Report and use the positive value. | **Right-Tailed**  Report and use the positive value. |
| Test Statistic | Where, pooled variance, |  |
| P-Value | **Two-Tailed**  Use the positive t in the formula even if the test statistic is negative. | **Two-Tailed**  Use the positive t in the formula even if the test statistic is negative. |
| **Left-Tailed**  Include negative sign in the formula. | **Left-Tailed**  Include negative sign in the formula. |
| **Right-Tailed** | **Right-Tailed** |
| Conclusion | **Reject**  Reject the null hypothesis. There is enough evidence at the ( level of significance to conclude that <restate the alternative hypothesis in terms of the data>.  Answer any questions posed by the study. | **Reject**  Reject the null hypothesis. There is enough evidence at the ( level of significance to conclude that <restate the alternative hypothesis in terms of the data>.  Answer any questions posed by the study. |
| **Do Not Reject**  Do not reject the null hypothesis. There is not enough evidence at the ( level of significance to conclude that <restate the alternative hypothesis in terms of the data>. Answer any questions posed by the study. | **Do Not Reject**  Do not reject the null hypothesis. There is not enough evidence at the ( level of significance to conclude that <restate the alternative hypothesis in terms of the data>. Answer any questions posed by the study. |