LAB NO 3 (INDEPENDENT TEST)

The operating time of two different brands of mobile is given below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Colors | 4,5 | 5.4 | 3.9 | 6 | 5.6 | 7.2 | 5.6 | 5.8 | 6.2 |
| Vivo | 5.1 | 6.8 | 4.9 | 7.2 | 7 | 6.5 | 5.2 | 4.8 | 4 |

Is there any significant difference between operating time of two brands of mobile?

Hypothesis:

H0: µ1= µ2 i.e. There is no significant difference between the operating times of different brands of mobile.

H1: µ1= µ2 i.e. There is significant difference between the operating times of different brands of mobile.

Level of significance:

α=5%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| t-Test: Two-Sample Assuming Equal Variances | | | | |
|  |  |  |  |  |
|  | *Variable 1* | *Variable 2* |  |  |
| Mean | 5.577778 | 5.722222 |  |  |
| Variance | 0.906944 | 1.341944 |  |  |
| Observations | 9 | 9 |  |  |
| Pooled Variance | 1.124444 |  |  |  |
| Hypothesized Mean Difference | 0 |  |  |  |
| Df | 16 |  |  |  |
| t Stat | 0.28896 |  |  |  |
| P(T<=t) one-tail | 0.388161 |  |  |  |
| t Critical one-tail | 1.745884 |  |  |  |
| P(T<=t) two-tail | 0.776322 |  |  |  |
| t Critical two-tail | 2.119905 |  |  |  |

Decision:

Tcalc < Ttab, hence we accept H0.

Hence, we conclude that there is no significant difference between the operating times of two different brands of mobile.

LAB NO 4

The reaction time of two different brands of drug in two groups of patients is given below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group A | 10 | 14 | 8 | 16 | 13 |  |
| Group B | 11 | 9 | 12 | 17 | 14 | 16 |

At α=5% test whether two brands of drugs are equally efficient.

Hypothesis:

H0: µ1= µ2 i.e. both drugs are equally efficient.

H0: µ1≠µ2 i.e. both drugs are not equally efficient.

Level of significance:

α=5%

|  |  |  |
| --- | --- | --- |
| t-Test: Two-Sample Assuming Equal Variances | | |
|  |  |  |
|  | *Variable 1* | *Variable 2* |
| Mean | 12.2 | 13.16667 |
| Variance | 10.2 | 9.366667 |
| Observations | 5 | 6 |
| Pooled Variance | 9.737037 |  |
| Hypothesized Mean Difference | 0 |  |
| df | 9 |  |
| t Stat | 0.5116 |  |
| P(T<=t) one-tail | 0.310624 |  |
| t Critical one-tail | 1.833113 |  |
| P(T<=t) two-tail | 0.621248 |  |
| t Critical two-tail | 2.262157 |  |

Decision:

Tcalc < Ttab, hence we accept H0,

Hence, we conclude that both the drugs are equally efficient.

LAB NO 5 (PAIRED T TEST)

The marks obtained by 8 students in two attempts is given below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| First Attempt | 50 | 25 | 44 | 45 | 30 | 38 | 55 | 60 |
| Second Attempt | 52 | 23 | 46 | 50 | 27 | 41 | 56 | 66 |

At α=5%, can you conclude that there is no significant difference between score of students in two attempts.

Hypothesis:

H0: µ1= µ2 ie. There is no significant difference between the two attempts.

H0: µ1≠µ2 ie. There is no significant difference between the two attempts.

Level of significance:

α=5%

|  |  |  |  |
| --- | --- | --- | --- |
| t-Test: Paired Two Sample for Means | | | |
|  |  |  |  |
|  | *Variable 1* | *Variable 2* |  |
| Mean | 43.375 | 45.125 |  |
| Variance | 143.4107 | 208.6964 |  |
| Observations | 8 | 8 |  |
| Pearson Correlation | 0.989776 |  |  |
| Hypothesized Mean Difference | 0 |  |  |
| df | 7 |  |  |
| t Stat | 1.59397 |  |  |
| P(T<=t) one-tail | 0.077486 |  |  |
| t Critical one-tail | 1.894579 |  |  |
| P(T<=t) two-tail | 0.154972 |  |  |
| t Critical two-tail | 2.364624 |  |  |

Decision:

Tcalc < Ttab, hence we accept H0,

Hence, we conclude that there is no significant difference between the two attempts.

LAB 6 (PAIRED T TEST)

The performance score of employees before and after training is given below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Employee | A | B | C | D | E | F |
| Before | 6 | 7 | 6 | 11 | 16 | 12 |
| After | 9 | 8 | 4 | 15 | 21 | 13 |

At α=5%, test whether the training was effective or not.

Hypothesis:

H0: µ1= µ2 i.e. the training was not effective.

H0: µ1<µ2 i.e. the training was effective.

Level of significance:

α=5%

|  |  |  |
| --- | --- | --- |
| t-Test: Paired Two Sample for Means | | |
|  |  |  |
|  | *Variable 1* | *Variable 2* |
| Mean | 9.666667 | 11.66667 |
| Variance | 16.26667 | 35.86667 |
| Observations | 6 | 6 |
| Pearson Correlation | 0.946691 |  |
| Hypothesized Mean Difference | 0 |  |
| df | 5 |  |
| t Stat | 1.93649 |  |
| P(T<=t) one-tail | 0.055283 |  |
| t Critical one-tail | 2.015048 |  |
| P(T<=t) two-tail | 0.110567 |  |
| t Critical two-tail | 2.570582 |  |

Decision:

Tcal<Ttab, so we accept H0.

Hence, we conclude that the training was not effective.