Lab 4: T-test for mean, population standard deviation

A company manufactures a metal ring for industrial engines that usually weight about 50 ounces. A random sample of 50 of these metal rings produced the following weights. (In ounces)

Solution:

**Descriptive Statistics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N | Mean | StDev | SE Mean | 95% CI for μ |
| 50 | 49.620 | 6.577 | 0.930 | (47.751, 51.489) |

μ: mean of weight

**Test**

|  |  |
| --- | --- |
| Null hypothesis | H₀: μ = 50 |
| Alternative hypothesis | H₁: μ ≠ 50 |

|  |  |
| --- | --- |
| T-Value | P-Value |
| -0.41 | 0.685 |





**Conclusion:**

The graph of box and whisker plot and histogram shows that the data is left skewed i.e not normally distributed. Hence, t-test for mean is not valid test for population mean because it violates the fundamental assumptions that the data is normally distributed. The alternative test could be Wilcoxon signed rank test or sign test.

Further p-value=0.685>α-value=0.05, we accept the null hypothesis that the mean weight of metal ring is 50 ounce. The 95% confidence interval for population mean (µ) is 47.75 ounce to 51.49 ounce.