IT2120

Probability and Statistics

Lab Sheet 09

IT24103221

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Exercise

```
> setwd("C:\\Users\\Dell\\OneDrive - Sri Lanka Institute of Information Technology\\Desktop\\IT24103221")
> set.seed(123)
> sample_data <- rnorm(25, mean = 45, sd = 2)
> print(sample_data)
 [1] 43.87905 44.53965 48.11742 45.14102 45.25858 48.43013 45.92183 42.46988 43.62629 44.10868 47.44816 45.71963 45.80154 45.22137 43.88832 48.57383 45.99570 41.06677 46.40271
[20] 44.05442 42.86435 44.56405 42.94799 43.54222 43.74992
```

```
> t_test_result <- t.test(sample_data, mu = 46, alternative = "less")
> print(t_test_result)

        One Sample t-test

data:  sample_data
t = -2.8167, df = 24, p-value = 0.004776
alternative hypothesis: true mean is less than 46
95 percent confidence interval:
     -Inf 45.58124
sample estimates:
mean of x
 44.93334
```

```
> t_value <- t_test_result$statistic
> p_value <- t_test_result$p.value
> conf_interval <- t_test_result$conf.int
> cat("Test statistic (t):", t_value, "\n")
Test statistic (t): -2.81669
> cat("P-value:", p_value, "\n")
P-value: 0.004775633
> cat("Confidence Interval:", conf_interval, "\n")
Confidence Interval: -Inf 45.58124
```