IT24103496

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LAB SHEET 09

1.

```r
# Set working directory (change the path accordingly)
setwd("C:\\Users\\Dasun\\OneDrive\\Desktop\\it24103496")

# 1. Generate a random sample of size 25
set.seed(123)  # for reproducibility
sample_data <- rnorm(25, mean = 45, sd = 2)
sample_data
```

```
> setwd("C:\\Users\\Dasun\\OneDrive\\Desktop\\it24103496")
> setwd("C:\\Users\\Dasun\\OneDrive\\Desktop\\it24103496")
> # 1. Generate a random sample of size 25
> set.seed(123)  # for reproducibility
> sample_data <- rnorm(25, mean = 45, sd = 2)
> 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
[18] 41.06677 46.40271 44.05442 42.86435 44.56405 42.94799 43.54222 43.74992
```

2.

```r
# 2.
# One-sample t-test with alternative hypothesis "less"
t_test_result <- t.test(sample_data, mu = 46, alternative = "less")


t_test_result

# Extract values separately
t_statistic <- t_test_result$statistic
p_value <- t_test_result$p.value
conf_interval <- t_test_result$conf.int

cat("Test Statistic:", t_statistic, "\n")
cat("P-value:", p_value, "\n")
cat("95% Confidence Interval:", conf_interval, "\n")
```

```
> # 2. Test whether the average baking time is less than 46 minutes
> # One-sample t-test with alternative hypothesis "less"
> t_test_result <- t.test(sample_data, mu = 46, alternative = "less")
>
>
> 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
```

```
> # Extract values separately
> t_statistic <- t_test_result$statistic
> p_value <- t_test_result$p.value
> conf_interval <- t_test_result$conf.int
>
> cat("Test Statistic:", t_statistic, "\n")
Test Statistic: -2.81669
> cat("P-value:", p_value, "\n")
P-value: 0.004775633
> cat("95% Confidence Interval:", conf_interval, "\n")
95% Confidence Interval: -Inf 45.58124
```