Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No 09

IT24101836

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Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

```r
setwd("C:\\Users\\ASUS1\\OneDrive\\Desktop\\IT24101982_Lab_09_PS")
getwd()

# Q1
memes <- c(3, 7, 11, 0, 7, 0, 4, 5, 6, 2)
t.test(memes, mu = 3, alternative = "two.sided")

# Q2
mice <- c(17.6, 20.6, 22.2, 15.3, 20.9, 21.0, 18.9, 18.9, 18.9, 18.2)
t.test(mice, mu = 25, alternative = "less")

result <- t.test(mice, mu = 25, alternative = "less")

result$statistic
result$p.value
result$conf.int
mean(mice)

# Q3
set.seed(123) # reproducible
sugar <- rnorm(30, mean = 9.8, sd = 0.05)

t.test(sugar, mu = 10, alternative = "greater")

# Exercise
set.seed(123)
baking <- rnorm(25, mean = 45, sd = 2)

t.test(baking, mu = 46, alternative = "less")
```

```
> setwd("C:\\Users\\ASUS1\\OneDrive\\Desktop\\IT24101982_Lab_09_PS")
> getwd()
[1] "C:/Users/ASUS1/OneDrive/Desktop/IT24101982_Lab_09_PS"
>
> # Q1
> memes <- c(3, 7, 11, 0, 7, 0, 4, 5, 6, 2)
> t.test(memes, mu = 3, alternative = "two.sided")

        One Sample t-test

data:  memes
t = 1.3789, df = 9, p-value = 0.2012
alternative hypothesis: true mean is not equal to 3
95 percent confidence interval:
 2.0392 6.9608
sample estimates:
mean of x
      4.5

>
> # Q2
> mice <- c(17.6, 20.6, 22.2, 15.3, 20.9, 21.0, 18.9, 18.9, 18.9, 18.2)
> t.test(mice, mu = 25, alternative = "less")

        One Sample t-test

data:  mice
t = -9.0783, df = 9, p-value = 3.977e-06
alternative hypothesis: true mean is less than 25
95 percent confidence interval:
     -Inf 20.41105
sample estimates:
mean of x
    19.25
```

```
>
> result <- t.test(mice, mu = 25, alternative = "less")
>
> result$statistic
        t
-9.078319
> result$p.value
[1] 3.976692e-06
> result$conf.int
[1]     -Inf 20.41105
attr(,"conf.level")
[1] 0.95
> mean(mice)
[1] 19.25
>
> # Q3
> set.seed(123) # reproducible
> sugar <- rnorm(30, mean = 9.8, sd = 0.05)
>
> t.test(sugar, mu = 10, alternative = "greater")

        One Sample t-test

data:  sugar
t = -22.596, df = 29, p-value = 1
alternative hypothesis: true mean is greater than 10
95 percent confidence interval:
 9.782428      Inf
sample estimates:
mean of x
 9.797645
```

```
>
> # Exercise
> set.seed(123)
> baking <- rnorm(25, mean = 45, sd = 2)
>
> t.test(baking, mu = 46, alternative = "less")

        One Sample t-test

data:  baking
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
```