

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

```
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
```

The screenshot shows the RStudio Environment pane. At the top, there are tabs for Environment, History, Connections, and Tutorial. Below the tabs, there are icons for Import Dataset, a memory usage indicator (164 MiB), and a search icon. The Environment pane shows a variable named 'result' of type 'List of 10'. Below this, the 'values' section displays the first few rows of the data frame:

	num [1:25]
baking	43.9 44.5 48.1 45.1 45.3 ...
memes	3 7 11 0 7 0 4 5 6 2
mice	17.6 20.6 22.2 15.3 20.9 21 18.9 18.9 18.9 18.2
sugar	9.77 9.79 9.88 9.8 9.81 ...