Sri Lanka Institute of Information Technology

Lab Submission

Lab sheet No 09

IT23756564

Karunaratne B.C.M.L

Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

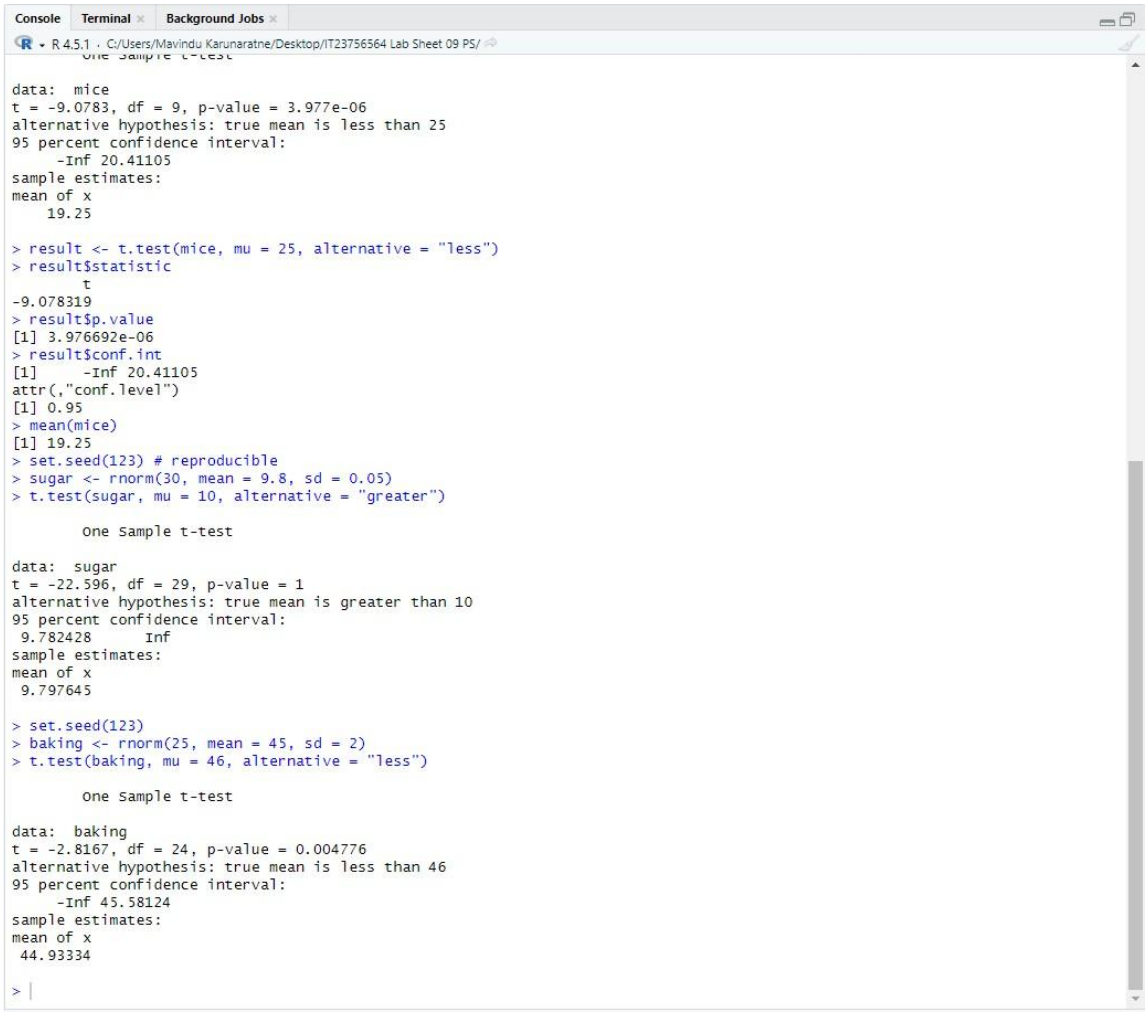
IT23756564 Lab Sheet 09 PS.R

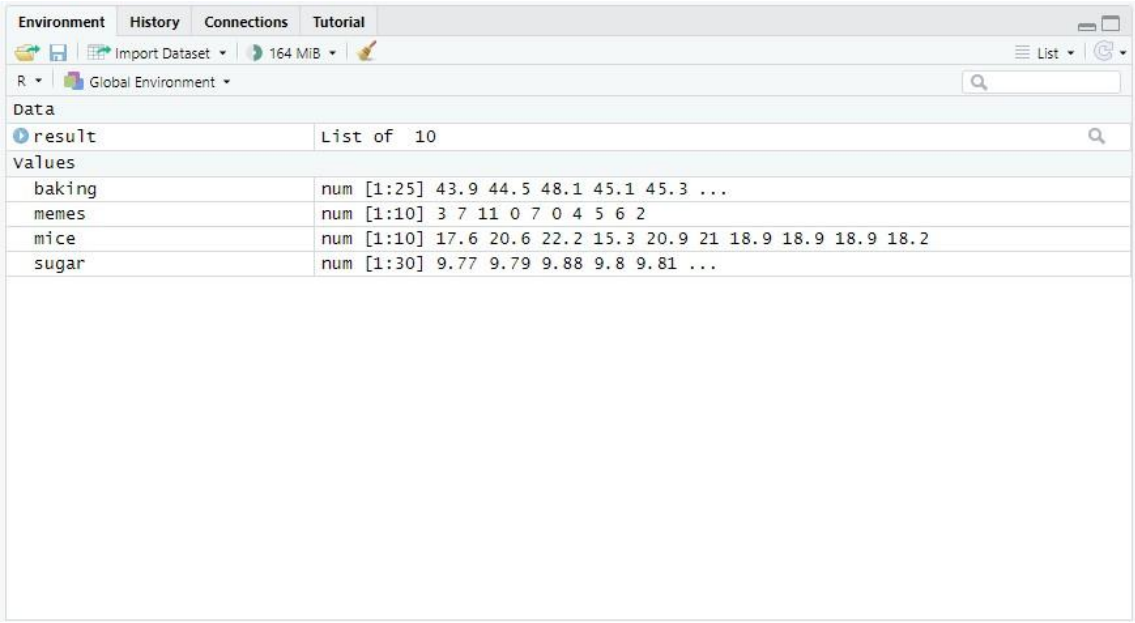
```r
setwd("C:\\Users\\Mavindu Karunaratne\\Desktop\\IT23756564 Lab Sheet 09 PS")
getwd()

# 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")
```

Console | Terminal | Background Jobs

R 4.5.1 · C:/Users/Mavindu Karunaratne/Desktop/IT23756564 Lab Sheet 09 PS/

```
> setwd("C:\\Users\\Mavindu Karunaratne\\Desktop\\IT23756564 Lab Sheet 09 PS")
> getwd()
[1] "C:/Users/Mavindu Karunaratne/Desktop/IT23756564 Lab Sheet 09 PS"
> 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

> 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
> set.seed(123) # reproducible
> sugar <- rnorm(30, mean = 9.8, sd = 0.05)
> t.test(sugar, mu = 10, alternative = "greater")

        One Sample t-test
```


Console
Terminal
Background Jobs
R 4.5.1 · C:/Users/Mavindu Karunaratne/Desktop/IT23756564 Lab Sheet 09 PS/
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
> 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
> 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
>


Environment
History
Connections
Tutorial
Import Dataset
164 MiB
List
R
Global Environment
Data
result
List of 10
values
baking
num [1:25] 43.9 44.5 48.1 45.1 45.3 ...
memes
num [1:10] 3 7 11 0 7 0 4 5 6 2
mice
num [1:10] 17.6 20.6 22.2 15.3 20.9 21 18.9 18.9 18.9 18.2
sugar
num [1:30] 9.77 9.79 9.88 9.8 9.81 ...