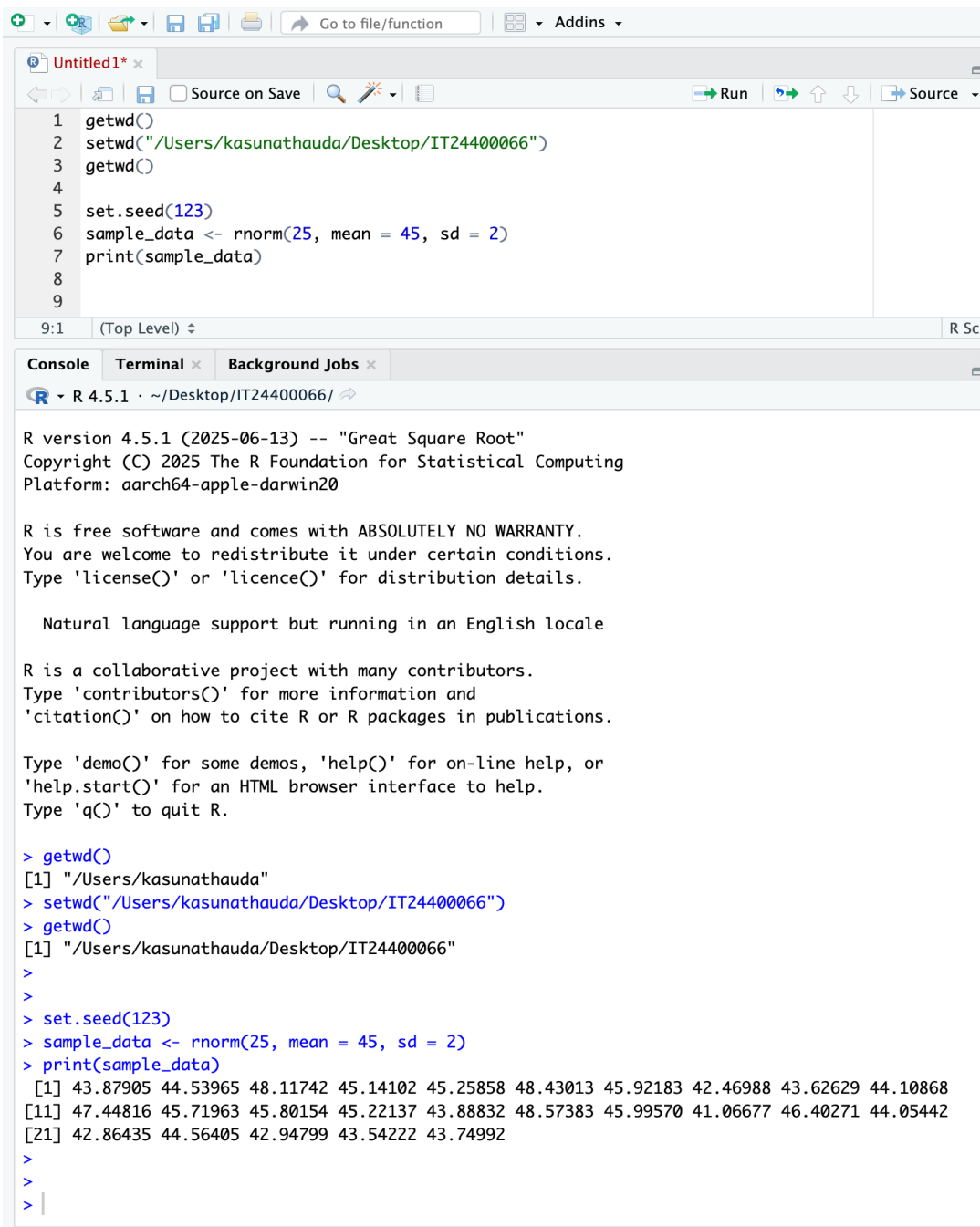


# Probability and Statistics - IT2120

## Lab Sheet 09

1.



The screenshot shows the RStudio IDE interface. The top pane contains a script with the following R code:

```
1 getwd()
2 setwd("/Users/kasunathauda/Desktop/IT24400066")
3 getwd()
4
5 set.seed(123)
6 sample_data <- rnorm(25, mean = 45, sd = 2)
7 print(sample_data)
8
9
```

The bottom pane shows the console output for the executed code:

```
R version 4.5.1 (2025-06-13) -- "Great Square Root"
Copyright (C) 2025 The R Foundation for Statistical Computing
Platform: aarch64-apple-darwin20

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

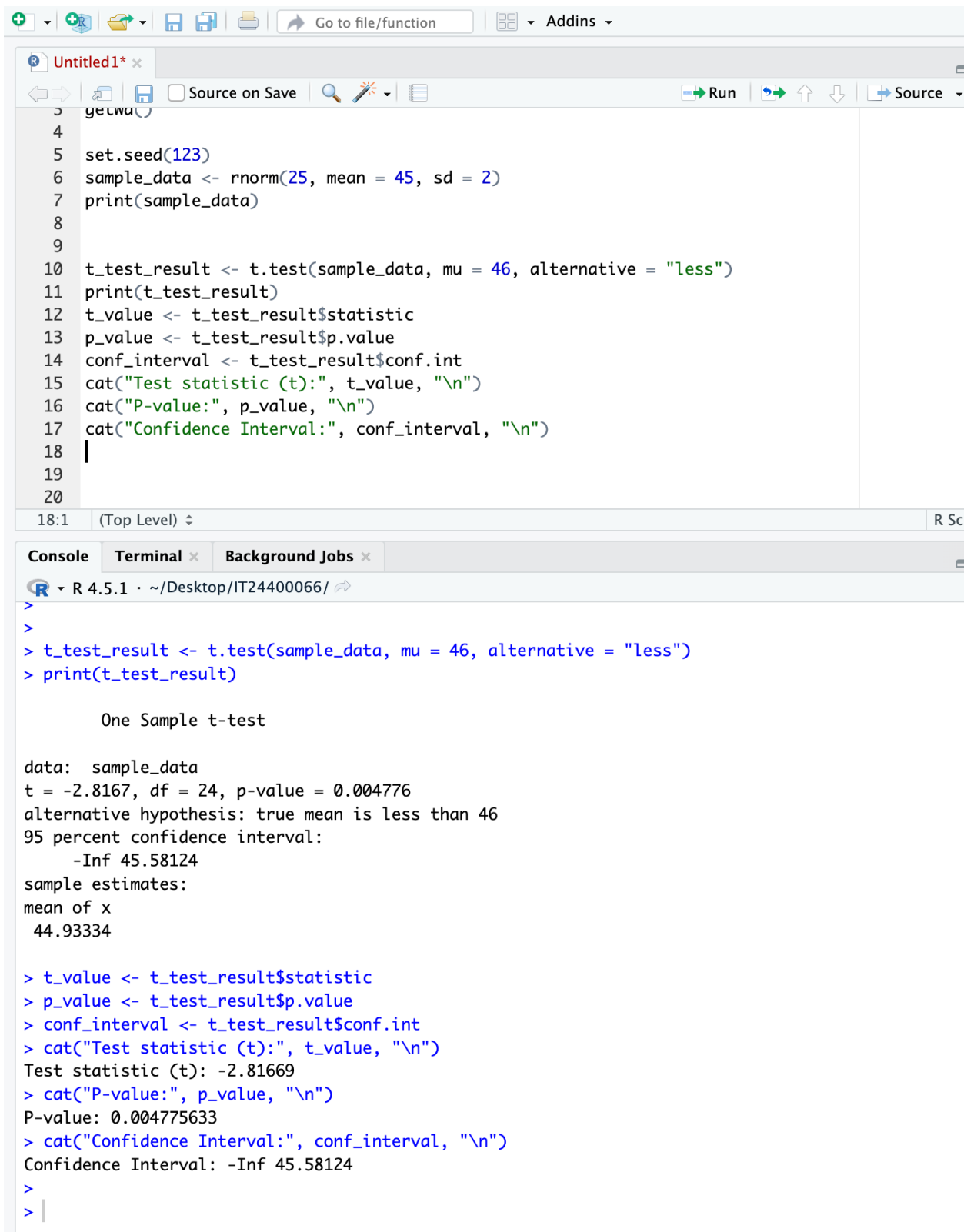
Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> getwd()
[1] "/Users/kasunathauda"
> setwd("/Users/kasunathauda/Desktop/IT24400066")
> getwd()
[1] "/Users/kasunathauda/Desktop/IT24400066"
>
>
> 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
[11] 47.44816 45.71963 45.80154 45.22137 43.88832 48.57383 45.99570 41.06677 46.40271 44.05442
[21] 42.86435 44.56405 42.94799 43.54222 43.74992
>
>
> |
```

2.



The image shows the RStudio IDE interface. The top toolbar includes icons for file operations and a search bar. The editor window, titled 'Untitled1\*', contains an R script. The script generates random data, performs a one-sample t-test with a null hypothesis mean of 46, and prints the results. The console window at the bottom shows the execution of the script, displaying the t-test output and the extracted values for the test statistic, p-value, and confidence interval.

```
getwd()
4
5 set.seed(123)
6 sample_data <- rnorm(25, mean = 45, sd = 2)
7 print(sample_data)
8
9
10 t_test_result <- t.test(sample_data, mu = 46, alternative = "less")
11 print(t_test_result)
12 t_value <- t_test_result$statistic
13 p_value <- t_test_result$p.value
14 conf_interval <- t_test_result$conf.int
15 cat("Test statistic (t):", t_value, "\n")
16 cat("P-value:", p_value, "\n")
17 cat("Confidence Interval:", conf_interval, "\n")
18
19
20
```

18:1 (Top Level) R Sc

Console Terminal Background Jobs

R 4.5.1 · ~/Desktop/IT24400066/

```
>
>
> 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
>
>
```