

IT2120 - Probability and Statistics

IT24103994

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## Lab Sheet 09

### Exercise

```
> setwd("C:\\Users\\USER\\Desktop\\IT24103994")
> getwd()
[1] "C:/Users/USER/Desktop/IT24103994"
```

01)

i)

```
> #part 1
> set.seed(42)
> sample <- rnorm(25, mean = 45, sd = 2)
> sample
 [1] 47.74192 43.87060 45.72626 46.26573 45.80854
 [2] 44.78775 48.02304 44.81068 49.03685 44.87457
 [3] 47.60974 49.57329 42.22228 44.44242 44.73336
 [4] 46.27190 44.43149 39.68709 40.11907 47.64023
 [5] 44.38672 41.43738 44.65617 47.42935 48.79039
 [6] 45.12345 46.78901 43.56789 48.90123 42.34567
 [7] 47.89012 44.56789 49.12345 43.78901 46.01234
 [8] 45.67890 48.23456 42.90123 47.34567 44.01234
 [9] 46.56789 49.89012 43.12345 47.67890 45.90123
 [10] 44.23456 48.56789 41.90123 46.89012 49.34567
 [11] 47.01234 45.45678 48.78901 43.01234 46.12345
 [12] 44.90123 49.67890 42.56789 47.23456 45.78901
 [13] 46.34567 48.12345 41.23456 47.56789 44.67890
 [14] 45.01234 49.45678 43.67890 46.90123 48.01234
 [15] 47.45678 44.78901 49.23456 42.89012 46.45678
 [16] 45.34567 48.67890 41.56789 47.12345 45.89012
 [17] 46.78901 49.01234 43.90123 47.89012 44.23456
 [18] 45.67890 48.34567 42.12345 47.01234 45.12345
 [19] 46.90123 49.56789 43.45678 47.34567 44.56789
 [20] 45.23456 48.89012 41.78901 46.67890 49.67890
 [21] 47.56789 45.01234 48.90123 43.23456 46.34567
 [22] 44.89012 49.78901 42.67890 47.67890 45.67890
 [23] 46.12345 48.01234 41.01234 47.90123 44.90123
 [24] 45.45678 49.34567 43.34567 46.01234 48.45678
 [25] 47.78901 44.67890 49.01234 42.45678 46.78901

> mean(sample)
[1] 45.37507
> sd(sample)
[1] 2.612729
> length(sample)
[1] 25
```

ii)

```
> #part 2
> t.test(sample, mu = 46, alternative = "less")

      One Sample t-test

data:  sample
t = -1.1959, df = 24, p-value = 0.1217
alternative hypothesis: true mean is less than 46
95 percent confidence interval:
 -Inf 46.26909
sample estimates:
mean of x
 45.37507
```