

Faculty of Computing

Year 2 Semester 1 (2025)

IT2120 - Probability and Statistics

Lab Sheet 09

IT24101825

H.M.N.D.HERATH

```
setwd("C:/Users/NAWEEN/OneDrive/Desktop/PS LABS")

#Performs a one-sample t-test on vector x (created using c()) to check if its
#mean is significantly different from the hypothesized value mu = 3; key terms: t.test(), mu, one-sample t-test, p-value, t-statistic.
x<-c(3,7,11,0,7,0,4,5,6,2)
t.test(x,mu = 3 )

#Performs a one-sample t-test on vector weight (created using c()) to test if the sample mean is significantly less than the hypothesized mean mu = 25; key terms: t.test(), mu, alternative = "less",
#one-tailed t-test, p-value, t-statistic.
weight<-c( 17.6, 20.6, 22.2, 15.3, 20.9, 21.0, 18.9, 18.9, 18.9, 18.2)
t.test(weight , mu=25 , alternative="less")

#Stores the result of a one-sample t-test (testing if the mean of weight is less than 25) in the variable res; key terms: t.test(), assignment <-, mu, alternative="less",
#one-tailed t-test, test result object.
res<- t.test(weight , mu=25 , alternative="less")

#Extracts the t-statistic value from the t-test result object res;
#key terms: $ (list extraction), statistic, t-statistic, t-test result object.
res$statistic

#Extracts the p-value from the t-test result object
res$p.value

#Extracts the confidence interval of the population mean from the t-test result object
res$conf.int

#Generates a numeric vector y of 30 random values from a normal distribution
#with mean 9.8 and standard deviation 0.05; key terms#
y<- rnorm(30,mean = 9.8, sd = 0.05)

#Performs a one-sample t-test on vector y to test if its mean is significantly greater
#than the hypothesized value mu = 10#
t.test(y , mu=10 , alternative="greater")

#EXERCISE#
baking_time <- rnorm(25, mean = 45, sd = 2)

res <- t.test(baking_time, mu = 46, alternative = "less")

res$statistic
res$p.value
res$conf.int
```

Name	Type	Value
res	list [10] (S3: htest)	List of length 10
statistic	double [1]	-1.49641
parameter	double [1]	24
p.value	double [1]	0.07379138
conf.int	double [2]	-Inf 46.1
estimate	double [1]	45.30047
null.value	double [1]	46
stderr	double [1]	0.4674754
alternative	character [1]	'less'
method	character [1]	'One Sample t-test'
data.name	character [1]	'baking_time'

```
> res$statistic
```

```
      t
-1.49641
```

```
> res$p.value
```

```
[1] 0.07379138
```

```
> res$conf.int
```

```
[1]      -Inf 46.10026
```

```
attr(,"conf.level")
```

```
[1] 0.95
```