

**DELHI TECHNOLOGICAL
UNIVERSITY**

**PROBABILITY AND STATISTICS (MC-
205)**

PRACTICAL FILE



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EXPERIMENT 7

Hypothesis testing using t-test.

SOURCE CODE:

1. One sample t-test

```
x=rnorm(200)
t.test(x,mu=5)
```

2. Two sample t-test

```
x=rnorm(200)
y=rnorm(200)
t.test(x,y)
```

3. Directional Hypothesis

```
x <- rnorm(100)

t.test(x, mu = 2, alternative = 'greater')

t.test(x, mu = 2, alternative = 'less')

t.test(x, mu = 2, alternative = 'two.sided')
```

OUTPUT:

1. One sample t-test

One Sample t-test

```
data: x
t = -77.551, df = 199, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 5
95 percent confidence interval:
 -0.18535239 0.07181378
sample estimates:
 mean of x
-0.05676931
```

2. Two sample t-test

welch Two Sample t-test

```
data: x and y
t = 0.66032, df = 396.84, p-value = 0.5094
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.1326722 0.2668695
sample estimates:
 mean of x mean of y
 0.02885541 -0.03824322
```

3. Directional Hypothesis

One Sample t-test

```
data: x
t = -19.275, df = 99, p-value = 1
alternative hypothesis: true mean is greater than 2
95 percent confidence interval:
 -0.2629463      Inf
sample estimates:
 mean of x
-0.08347269
```

```

One sample t-test

data: x
t = -19.275, df = 99, p-value < 2.2e-16
alternative hypothesis: true mean is less than 2
95 percent confidence interval:
    -Inf 0.09600088
sample estimates:
mean of x
-0.08347269

One sample t-test

data: x
t = -19.275, df = 99, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 2
95 percent confidence interval:
 -0.2979490  0.1310036
sample estimates:
mean of x
-0.08347269

```

CONCLUSION:

Hypothesis Testing is a process of testing the hypothesis made by the researcher or to validate the hypothesis. To perform hypothesis testing, a random sample of data from the population is taken and testing is performed. Based on the results of testing, the hypothesis is either selected or rejected.

One sample T-Testing approach collects a huge amount of data and tests it on random samples. This test is used to test the mean of the sample with the population.

In **two sample T-Testing**, the sample vectors are compared. If `var.equal = TRUE`, the test assumes that the variances of both the samples are equal.

Using the **directional hypothesis**, the direction of the hypothesis can be specified like, if the user wants to know the sample mean is lower or greater than another mean sample of the data.