DELHI TECHNOLOGICAL UNIVERSITY

PROBABILITY AND STATISTICS (MC-205)

PRACTICAL FILE

SUBMITTED TO:

PROF. JAMKHONGAM TOUTHANG

SUBMITTED BY:

NITYA MITTAL

(2K19/MC/089)

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EXPERIMENT 8

Z-Test of one and two proportions

SOURCE CODE:

1. Z-Test of One Proportion

```
res <- prop.test(x = 95, n = 160, p = 0.5,correct = FALSE)
res
```

2. Z-Test of Two Proportions

```
res <- prop.test(x = c(490, 400), n = c(500, 500))
res
```

OUTPUT:

1. Z-Test of One Proportion

```
> res <- prop.test(x = 95, n = 160, p = 0.5,correct = FALSE)
> res

        1-sample proportions test without continuity correction

data:  95 out of 160, null probability 0.5
X-squared = 5.625, df = 1, p-value = 0.01771
alternative hypothesis: true p is not equal to 0.5
95 percent confidence interval:
 0.5163169 0.6667870
sample estimates:
      p
0.59375
```

2. Z-Test of Two Proportions

```
> res <- prop.test(x = c(490, 400), n = c(500, 500))
> res

        2-sample test for equality of proportions with continuity correction

data:  c(490, 400) out of c(500, 500)
X-squared = 80.909, df = 1, p-value < 2.2e-16
alternative hypothesis: two.sided
95 percent confidence interval:
 0.1408536 0.2191464
sample estimates:
prop 1 prop 2
  0.98   0.80
```

CONCLUSION:

A ***Z*-test** is any statistical test for which the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution. Z-test tests the mean of a distribution. For each significance level in the confidence interval, the *Z*-test has a single critical value which makes it more convenient than the Student's *t*-test whose critical values are defined by the sample size (through the corresponding degrees of freedom).

Because of the **central limit theorem**, many test statistics are approximately normally distributed for large samples. Therefore, many statistical tests can be conveniently performed as approximate *Z*-tests if the sample size is large or the population variance is known.