MAT5007 – Applied Statistical Methods

Embedded Lab – *R* Statistical Software

FALL SEMESTER –
20222023L25+L26
SLOT

E-RECORD
Experiment No.: 6
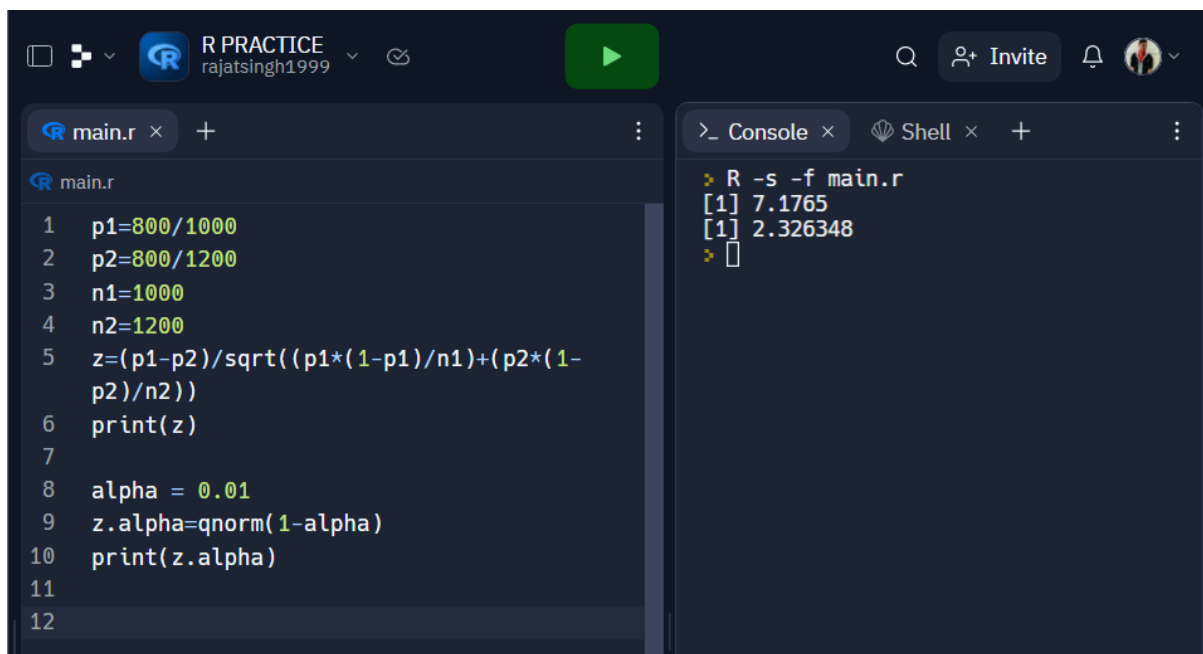
Submitted By

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SITE

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1. Before an increase in excise duty on tea, 800 people out of a sample of 1000 were consumers of tea. After the increase in duty, 800 people were consumers of tea in a sample of 1200 persons. Write down the R programming code to test whether the significant decrease in the consumption of tea after the increase in duty at 1 % level of significance.
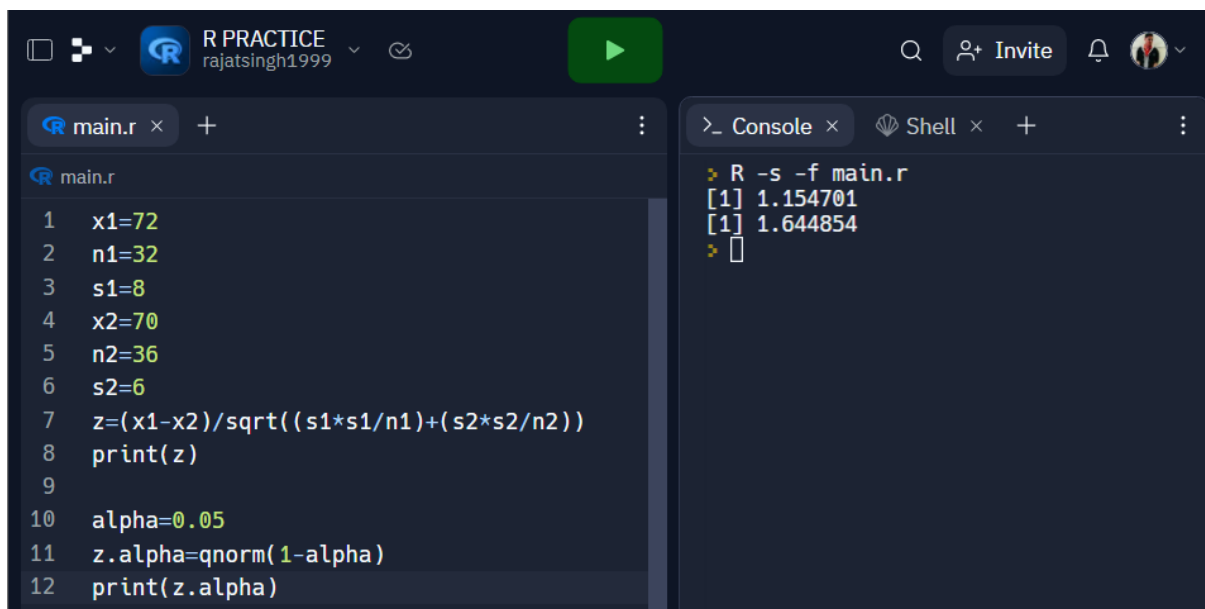
```
R PRACTICE
rajatsingh1999

main.r

main.r
1   p1=800/1000
2   p2=800/1200
3   n1=1000
4   n2=1200
5   z=(p1-p2)/sqrt((p1*(1-p1)/n1)+(p2*(1-
    p2)/n2))
6   print(z)
7
8   alpha = 0.01
9   z.alpha=qnorm(1-alpha)
10  print(z.alpha)
11
12

> Console ×   Shell ×   +

> R -s -f main.r
[1] 7.1765
[1] 2.326348
>
```

The test statistic 7.1765 is greater than the critical value of 2.326348 (right tailed test). Hence, at 0.01 significance level, we succeed in rejecting the null hypothesis that there is no significant decrease in the consumption of tea after the increase in duty.

2. The average mark scored by 32 boys is 72 with a standard deviation of 8, while that for 36 girls is 70 with a standard deviation of 6. Write down the R programming code to test whether the boys are performing better than girls on the basis of average mark at 5 % level of significance.

```
x1=72
n1=32
s1=8
x2=70
n2=36
s2=6
z=(x1-x2)/sqrt((s1*s1/n1)+(s2*s2/n2))
print(z)

alpha=0.05
z.alpha=qnorm(1-alpha)
print(z.alpha)
```

```
> R -s -f main.r
[1] 1.154701
[1] 1.644854
>
```

The test statistic 1.154701 is less than the critical value 1.644854 (right tailed test). Hence, at 0.05 significance level, we fail to reject the null hypothesis that boys are performing equally well as the girls based on average marks.