

Hyder Presswala

B-2

16010122151

PSOT Tutorial:-06

BATCH -2

Q.1 Test the significance of the difference between the means of two normal population with the same standard deviation from the following data.

	Size	Mean	St. Dev
Sample-1	1000	25	5
Sample-2	2000	23	7

Code:-

```
sm1= 25 # mean for sample 1
sm2=23 # mean for sample 2
sd1=5 # standard deviation of sample1
sd2=7 # standard deviation of sample2
n1= 1000 # size of sample 1
n2= 2000 # size of sample 2
zcal= abs((sm1-sm2)/sqrt((sd1^2/n2)+(sd2^2/n1)))
cat("absolute value of z-calculated is ",zcal)
cat("Name & Roll Number ","Hyder Presswala 16010122151")
```

Output:-

The screenshot shows the RStudio environment. The script editor contains the following code:

```

1 sm1= 25 # mean for sample 1
2 sm2=23 # mean for sample 2
3 sd1=5 # standard deviation of sample1
4 sd2=7 # standard deviation of sample2
5 n1= 1000 # size of sample 1
6 n2= 2000 # size of sample 2
7 zcal= abs((sm1-sm2)/sqrt((sd1^2/n2)+(sd2^2/n1)))
8 cat("absolute value of z-calculated is ",zcal)
9 cat("Name & Roll Number ", "Hyder Presswala 16010122151")
10

```

The console shows the execution of the code with an error message at the top:

```

R 4.3.2 ~-:/
Error: unexpected symbol in: zcal= abs((sm1-sm2)/sqrt((sd1^2/n2)+(sd2^2/n1))) cat
> sm1= 25 # mean for sample 1
> sm2=23 # mean for sample 2
> sd1=5 # standard deviation of sample1
> sd2=7 # standard deviation of sample2
> n1= 1000 # size of sample 1
> n2= 2000 # size of sample 2
> zcal= abs((sm1-sm2)/sqrt((sd1^2/n2)+(sd2^2/n1)))
> cat("absolute value of z-calculated is ",zcal)
absolute value of z-calculated is 8.064778> cat("Name & Roll Number ", "Hyder Presswala 16010122151")
Name & Roll Number Hyder Presswala 16010122151
>

```

The environment pane on the right shows the following variables:

Variable	Value
sm1	25
sm2	23
x	num [1:10] 78 36 98 25 45 ...
x1	50
y	num [1:10] 84 51 91 60 68 ...
y1	90
zcal	8.06477838545512

Q.2. The weights of eight randomly selected athletes are recorded in kilograms: 70, 75, 78, 80, 82, 85, 87, 90. The weights of twelve randomly selected basketball players are recorded in kilograms: 72, 74, 76, 78, 79, 80, 82, 83, 84, 85, 87, 88. Can it be concluded that basketball players, on average, weigh more than athletes?

Code:-

```

x1 <- c(70, 75, 78, 80, 82, 85, 87, 90)
x2 <- c(72, 74, 76, 78, 79, 80, 82, 83, 84, 85, 87, 88)
sm1= mean (x1) # mean for sample 1
sm2= mean (x2) # mean for sample 2
sd1=sd(x1) # standard deviation of sample1
sd2= sd(x2) # standard deviation of sample2
n1= 8 # size of sample 1
n2= 12 # size of sample 2
tcal= abs((sm1-sm2)/sqrt(((n1*sd1^2+n2*sd2^2)/(n1+n2-2))*((1/n1)+(1/n2))))
cat("absolute value of t-calculated is ",tcal)
cat("Name & Roll Number ", "Hyder Presswala 16010122151")

```

Output:-

The screenshot shows the RStudio environment with three tabs: 'Untitled1*', 'Untitled2*', and 'Untitled3*'. The main editor window contains the following R code:

```
1 x1 <- c(70, 75, 78, 80, 82, 85, 87, 90)
2 x2 <- c(72, 74, 76, 78, 79, 80, 82, 83, 84, 85, 87, 88)
3 sm1= mean(x1) # mean for sample 1
4 sm2= mean(x2) # mean for sample 2
5 sd1=sd(x1) # standard deviation of sample1
6 sd2= sd(x2) # standard deviation of sample2
7 n1= 8 # size of sample 1
8 n2= 12 # size of sample 2
9 tcal= abs((sm1-sm2)/sqrt(((n1*sd1^2+n2*sd2^2)/(n1+n2-2))*((1/n1)+(1/n2))))
10 cat("absolute value of t-calculated is ",tcal)
11
12 cat("Name & Roll Number ", "Hyder Presswala 16010122151")
13
```

The console window shows the execution of the code:

```
R 4.3.2 ~ /~/
> sm1= mean(x1) # mean for sample 1
> sm2= mean(x2) # mean for sample 2
> sd1=sd(x1) # standard deviation of sample1
> sd2= sd(x2) # standard deviation of sample2
> n1= 8 # size of sample 1
> n2= 12 # size of sample 2
> tcal= abs((sm1-sm2)/sqrt(((n1*sd1^2+n2*sd2^2)/(n1+n2-2))*((1/n1)+(1/n2))))
> cat("absolute value of t-calculated is ",tcal)
absolute value of t-calculated is 0.07582603
> cat("Name & Roll Number ", "Hyder Presswala 16010122151")
Name & Roll Number Hyder Presswala 16010122151
```

The Environment pane on the right shows the following objects:

Object	Class	Value
tcal	num	0.0758260300043977
x	num	[1:10] 78 36 98 25 45 ...
x1	num	[1:8] 70 75 78 80 82 8...
x2	num	[1:12] 72 74 76 78 79 ...
y	num	[1:10] 84 51 91 60 68
y1	num	90
zca1	num	8.06477838545512

Q.3. A random sample of 300 observations has a mean of 15.5 kg. Can it be a random sample from a population whose mean is 16 kg and variance is 20 kg?

Code:-

```
pm=16 # population mean
sm=15.5 # sample mean
sd=4.47 # standard deviation of sample or population
n= 300 # size of sample
zcal= abs((sm-pm)/(sd/sqrt(n)))
cat("absolute value of z-calculated is ",zcal)
cat("name & rollno", " Sarvesh Pingale & 16010122144")
cat("Name & Roll Number ", "Hyder Presswala 16010122151")
```

Output:-

Untitled1* x Untitled2* x Untitled3* x

Source on Save Run Source

```
1 pm=16 # population mean
2 sm=15.5 # sample mean
3 sd=4.47 # standard deviation of sample or population
4 n= 300 # size of sample
5 zcal= abs((sm-pm)/(sd/sqrt(n)))
6 cat("absolute value of z-calculated is ",zcal)
7 cat("name & rollno"," Sarvesh Pingale & 16010122144")
8 cat("Name & Roll Number ","Hyder Presswala 16010122151")
9
```

9:1 (Top Level) R Script

Console Terminal Background Jobs

```
R 4.3.2 ~ />
> cat("Name & Roll Number ",Hyder Presswala 16010122151 )
Name & Roll Number Hyder Presswala 16010122151
> pm=16 # population mean
> sm=15.5 # sample mean
> sd=4.47 # standard deviation of sample or population
> n= 300 # size of sample
> zcal= abs((sm-pm)/(sd/sqrt(n)))
> cat("absolute value of z-calculated is ",zcal)
absolute value of z-calculated is 1.937417> cat("name & rollno"," Sarvesh Pingale & 16010122144")
name & rollno Sarvesh Pingale & 16010122144> cat("Name & Roll Number ","Hyder Presswala 16010122151")
Name & Roll Number Hyder Presswala 16010122151
```

Environment History Connections Tutorial

Global Environment 121 MiB List

tcal	0.0758260300043977
x	num [1:10] 78 36 98 25 45
x1	num [1:8] 70 75 78 80 82 8
x2	num [1:12] 72 74 76 78 79
y	num [1:10] 84 51 91 60 68
y1	90
zcal	1.93741701070344

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