



**VIT<sup>®</sup>**  
Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)

### Activity 3: Measures of Central Tendency & Dispersion

**Name: Preyash**

**Date: 25/01/2022**

**Registration Number: 20BPS1022**

**Aim:** To get comfortable with solving questions related with the measure of central tendency on R Studio.

**Tools Used:** R Studio

**Syntax/ Commands used:**

length() → gives the length of the vector

mean() → gives the mean of the vector

sum() → gives the sum of the vector

sqrt() → gives the square root

**Questions:**

1. From the following data, find out which product is more stable in prices using R studio

Prices of Product A	20	22	19	23	16
Prices of Product B	10	20	18	12	15

### Code:

```
task1.R* x task2.R x task3.R x task4.R x
Source on Save
1 productA=c(20,22,19,23,16)
2 productB=c(10,20,18,12,15)
3 n1=length(productA)
4 n2=length(productB)
5 mA=mean(productA)
6 mB=mean(productB)
7 sdA=sqrt(sum((productA-mA)^2)/n1)
8 sdB=sqrt(sum((productB-mB)^2)/n2)
9 cA=(sdA/mA)*100
10 cB=(sdB/mB)*100
11 print(cA)
12 print(cB)
13 if(cA<cB){
14   print("Product A is more stable")
15 }else{
16   print("Product B is more stable")
17 }
18
```

### Output:

```
12:10 (Top Level)
Console Terminal x Jobs x
R 4.1.2 ~ /
> cB=(sdB/mB)*100
> print(cA)
[1] 12.24745
> print(cB)
[1] 24.58545
> if(cA<cB){
+   print("Product A is more stable")
+ }else{
+   print("Product B is more stable")
+ }
[1] "Product A is more stable"
>
```

2. Coefficient of variation of two different distributions are 58% and 69%. Their standard deviations are 21.2 and 15.6 respectively. Use R studio to find their arithmetic means.

### Code:

```
task1.R* x task2.R x task
Source on Save
1  cvA=58
2  cvB=69
3  sdA=21.2
4  sdB=15.6
5  meanA=(sdA/cvA)*100
6  meanB=(sdB/cvB)*100
7  meanA
8  meanB
```

### Output:

```
Console Terminal x Jobs x
R 4.1.2 ~ /
> cvA=58
> cvB=69
> sdA=21.2
> sdB=15.6
> meanA=(sdA/cvA)*100
> meanB=(sdB/cvB)*100
> meanA
[1] 36.55172
> meanB
[1] 22.6087
> |
```

3. Two samples of size 40 and 50 have the same mean 53, but different standard deviations 19 and 18 respectively. Find the combined standard deviation using R code.

#### Code:

```
1 n1=40
2 n2=50
3 m1=53
4 m2=53
5 sd1=19
6 sd2=18
7 sum1=n1*m1
8 sum2=n2*m2
9 x=(sum1+sum2)/(n1+n2)
10 x
11 d1=m1-x
12 d2=m2-x
13 sdt=sqrt(((n1*sd1*sd1)+(n2*sd2*sd2)+(n1*d1*d1)+(n2*d2*d2))/(n1+n2))
14 sdt
15
```

#### Output:

```
Console Terminal x Jobs x
R 4.1.2 ~ /
> sd2=18
> sum1=n1*m1
> sum2=n2*m2
> x=(sum1+sum2)/(n1+n2)
> x
[1] 53
> d1=m1-x
> d2=m2-x
> sdt=sqrt(((n1*sd1*sd1)+(n2*sd2*sd2)+(n1*d1*d1)+(n2*d2*d2))/(n1+n2))
> sdt
[1] 18.45114
> |
```

4. The mean and standard deviation of 200 items are found to be 60 and 20 respectively. If at the time of calculations two items were wrongly taken as 3 and 67 instead of 13 and 17, Write R code find the correct mean and standard deviation also find the correct coefficient of variation.

#### Code:

```
1 n=200
2 xw=60
3 sw=20
4 w1=3
5 w2=67
6 c1=13
7 c2=17
8 #finding the correct sum
9 correctsum=(xw*n)-(w1+w2)+(c1+c2)
10 #finding correct mean
11 correctmean=correctsum/n
12 incorrect_xi_sq=n*((sw*sw)+(xw*xw))
13 correct_xi_sq=incorrect_xi_sq-((w1*w1)+(w2*w2))+((c1*c1)+(c2*c2))
14 #correct sd
15 correct_sd=sqrt((correct_xi_sq/n)-(correctmean*correctmean))
16 #correct coeff of variance
17 cv=correct_sd/correctmean*100
18 print(correctmean)
19 print(correct_sd)
20 print(cv)
21
```

#### Output:

```
> print(correctmean)
[1] 59.8
> print(correct_sd)
[1] 20.09378
> print(cv)
[1] 33.60164
> |
```

Result: We successfully solved all the questions.

