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Activity 3: Measures of Central Tendency & Dispersion

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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

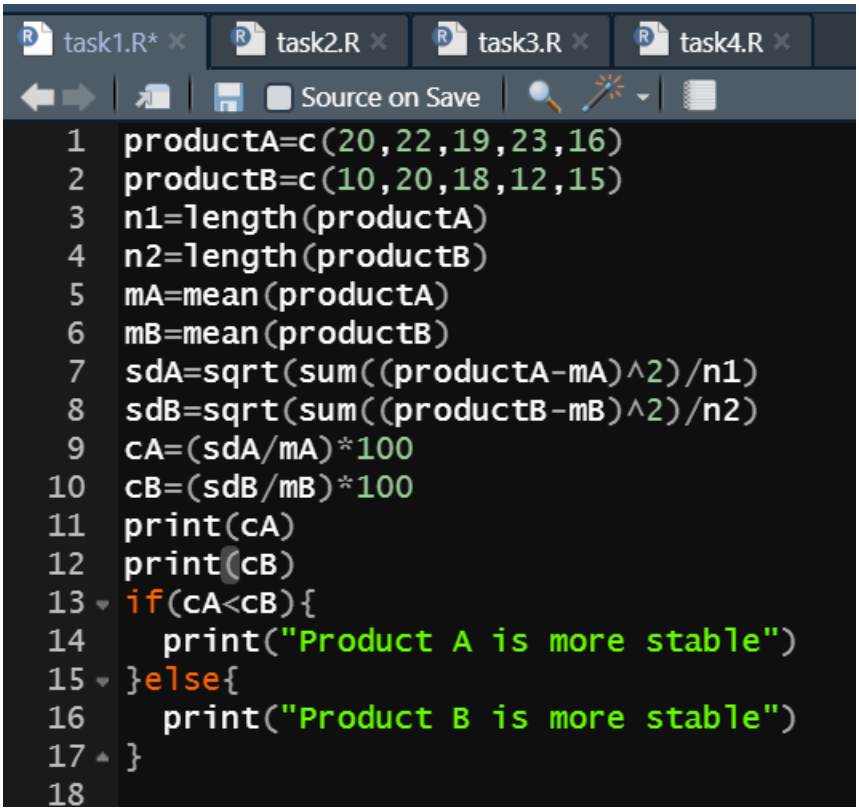
sqrt() → gives the square root

Questions:

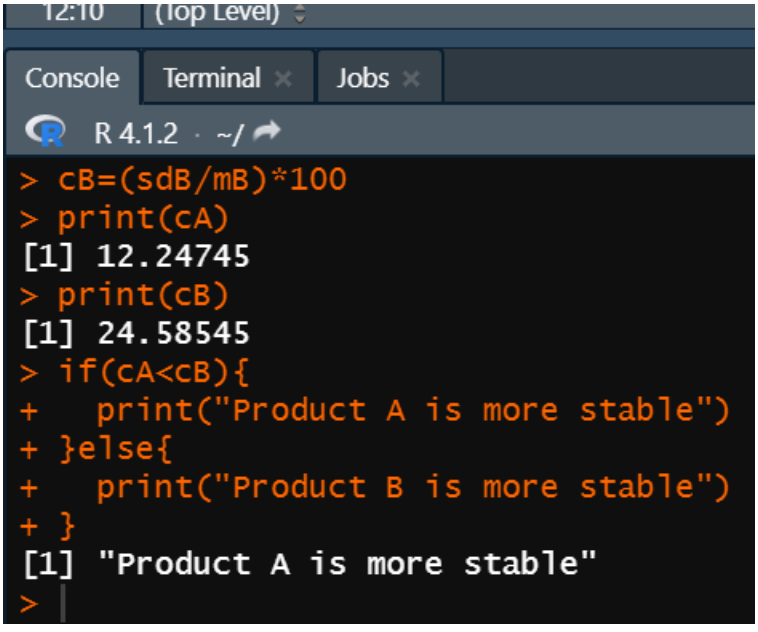
1. From the following data, find out which product is more stable in prices using R studio

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

Code:

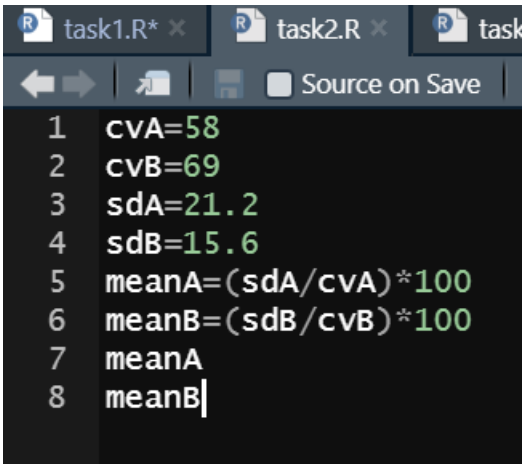

task1.R*
task2.R
task3.R
task4.R
Source on Save
productA=c(20,22,19,23,16)
productB=c(10,20,18,12,15)
n1=length(productA)
n2=length(productB)
mA=mean(productA)
mB=mean(productB)
sdA=sqrt(sum((productA-mA)^2)/n1)
sdB=sqrt(sum((productB-mB)^2)/n2)
cA=(sdA/mA)*100
cB=(sdB/mB)*100
print(cA)
print(cB)
if(cA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

Output:

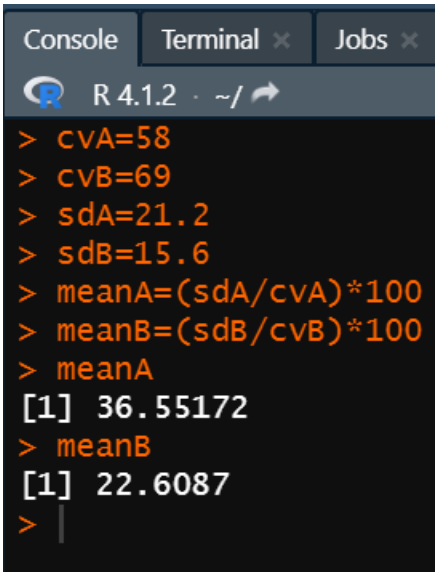

12:10
(Top Level)
Console
Terminal
Jobs
R 4.1.2 · ~/
> cB=(sdB/mB)*100
> print(cA)
[1] 12.24745
> print(cB)
[1] 24.58545
> if(cA<cB){
+ print("Product A is more stable")
+ }else{
+ print("Product B is more stable")
+ }
[1] "Product A is more stable"
>

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:

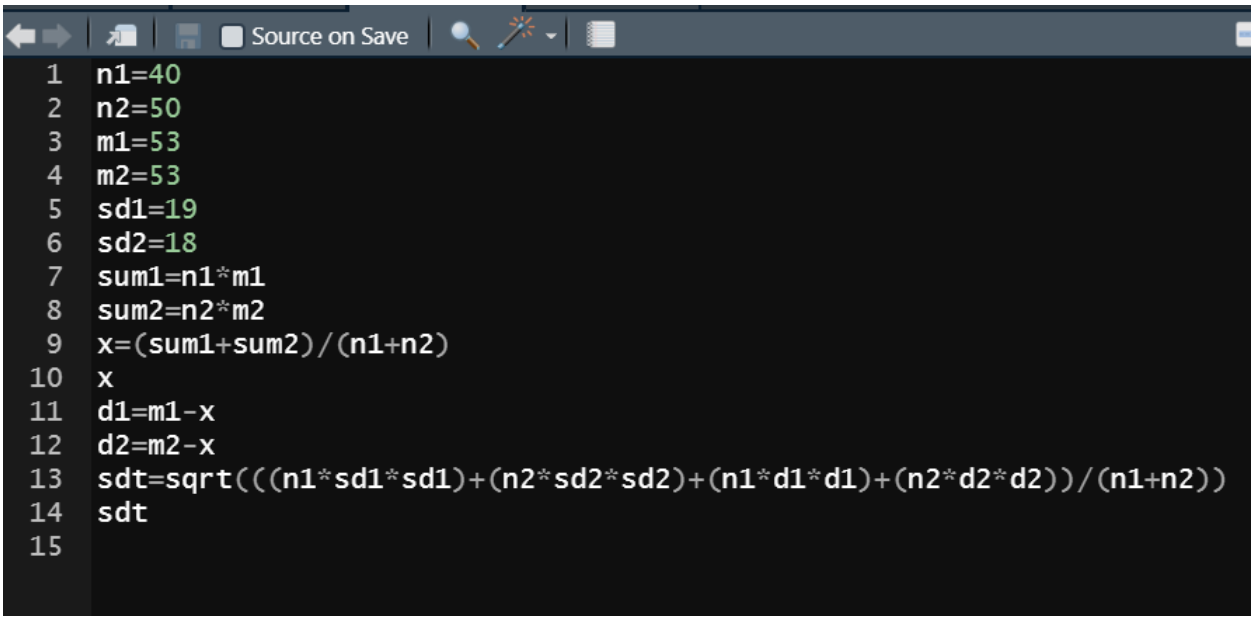


Output:

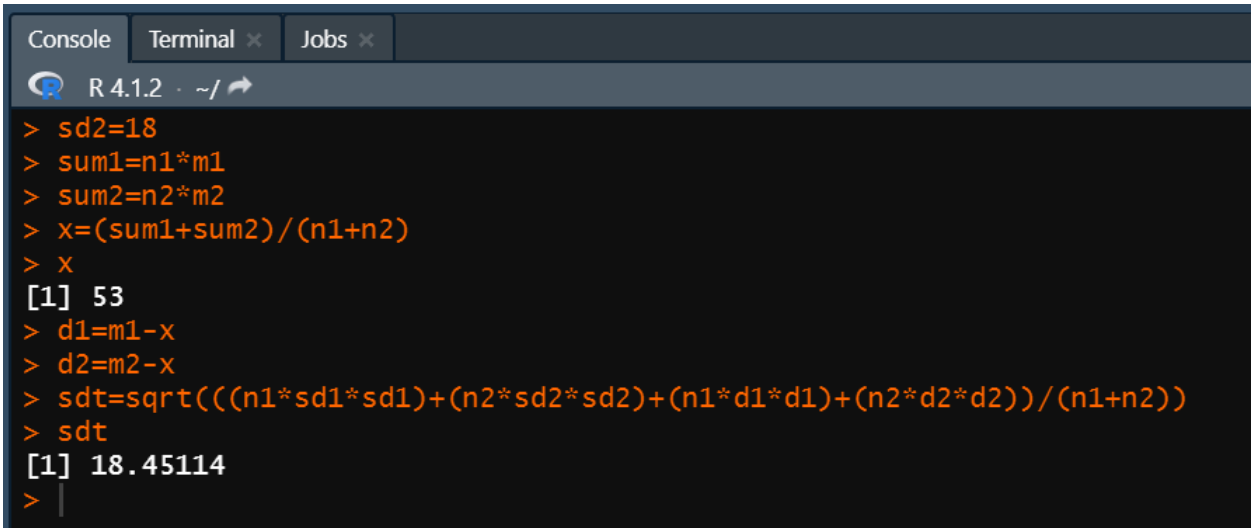


3. Two samples of size 40 and 50 have the same mean 53, but different standard deviations 19 and 18 respectively. Find the combined standard deviation using R code.

Code:



Output:



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:

```
n=200
xw=60
sw=20
w1=3
w2=67
c1=13
c2=17
#finding the correct sum
correctsum=(xw*n)-(w1+w2)+(c1+c2)
#finding correct mean
correctmean=correctsum/n
incorect_xi_sq=n*((sw*sw)+(xw*xw))
correct_xi_sq=incorect_xi_sq-((w1*w1)+(w2*w2))+((c1*c1)+(c2*c2))
#correct sd
correct_sd=sqrt((correct_xi_sq/n)-(correctmean*correctmean))
#correct coeff of variance
cv=correct_sd/correctmean*100
print(correctmean)
print(correct_sd)
print(cv)
```

Output:

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

Result: We successfully solved all the questions.