

ANALYSIS^{WITH}PROGRAMMING

cout << "let's do some analysis and programming" << endl;

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MEASURES OF RELATIVE VARIABILITY

R Programming

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The measure of relative variability is the coefficient of variation (CV). Unlike measures of absolute variability, the CV is unitless when it comes to comparisons between the dispersions of two distributions of different units of measurement. In R, CV is obtained using the `cv` function of the `raster` package.

Example 1. Below are the mean and standard deviation of the number of hours spent by Jacob every time he study the Stochastic Process with the corresponding scores he got out of the 100 items. Basing from this data, should one say that the number of hours he spent in studying is more variable than his exam scores, or the other way around? To determine this, we use the function below

Variable	Mean	Standard Deviation
Study Hours	25	2.6
Scores	69	5.3

```
> CV <- function(mean, sd){  
+   (sd/mean)*100  
+ }
```

And thus,

```
> CV(mean = 25, sd = 2.6)  
[1] 10.4  
>  
> CV(mean = 69, sd = 5.3)  
[1] 7.681159
```

Interpretation: It is very clear from the computed CV that, the study hours is more variable than the exam scores, even though the standard deviation of the scores is higher than the hours spent.

Example 2. Consider the heights (in centimetres) of 11 AB English junior students at MSU-TCTO: 151, 160, 162, 155, 154, 168, 153, 158, 157, 150, and 167. And also their corresponding weights (in kilograms): 61, 69, 73, 65, 64, 78, 63, 68, 67, 60, and 77. Compute and interpret the coefficient of variation.

Using the `cv` function of the `raster` package, we have

```
> heights <- c(151, 160, 162, 155, 154, 168, 153, 158, 157, 150, 167)
```

```
> weights <- c(61, 69, 73, 65, 64, 78, 63, 68, 67, 60, 77)
> library(raster)
> cv(heights)
[1] 3.826065
>
> cv(weights)
[1] 8.983467
```

Interpretation: The weights of the students are more variable than their heights as confirmed by the computed CV.

References

Asaad, Abubakar S. (2011). *Simplified Biostatistics*. Manila: Rex Book Store, Inc..

Labels

Descriptive Statistics, R, Tutorial