

These questions are to help verify that you understand the material on the "Explanation" link for the Completely Randomized Design of ANOVA.

Match each element of the following equation with its correct description.

$$Y_{ik} = \mu_i + \epsilon_{ik}$$

where $\epsilon_{ik} \sim N(0, \sigma^2)$.

3 ▼

Y_{ik}

2 ▼

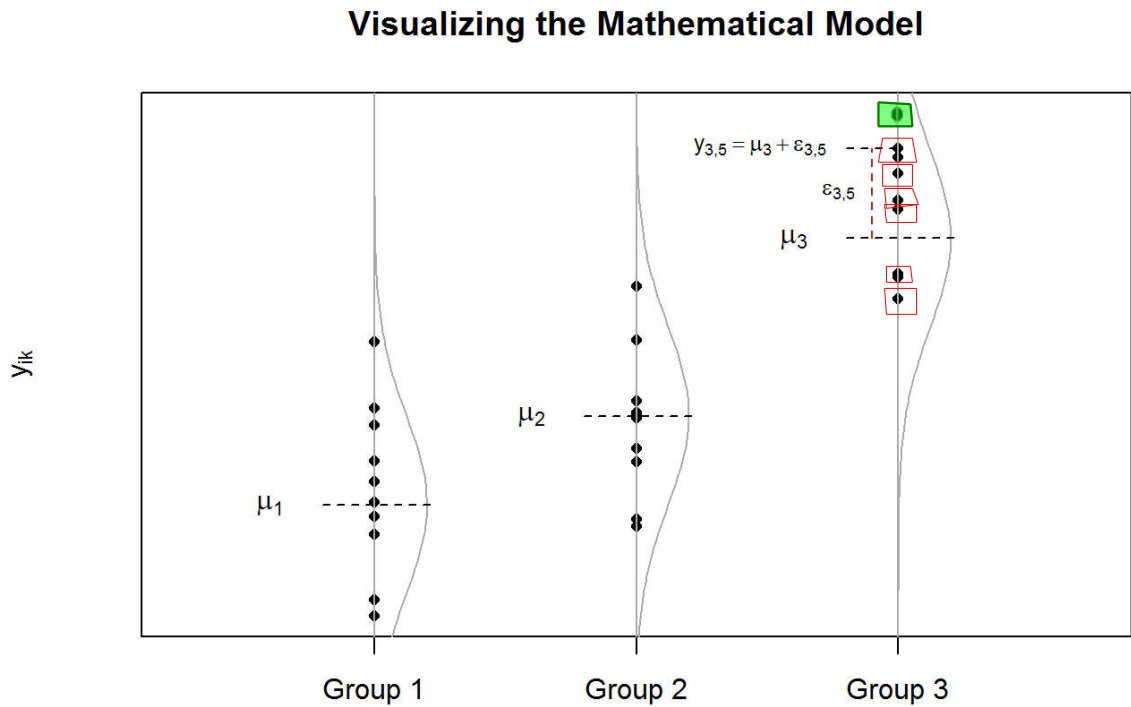
μ_i

1 ▼

ϵ_{ik}

1. The error term for the k^{th} data point of the i^{th} group. In other words, how far that data point is from the true mean μ_i .
2. The true population mean for group i .
3. The data points.

As explained in your Math 325 Notebook, the mathematical model for ANOVA (which is written above) can be visualized as in the following image. Consider the normal distribution shown for Group 3. (It has the highest mean of the three groups.) Select the point in that group that has the largest value of ϵ_{ik} .



The null hypothesis of ANOVA is that all the means

are equal ▼

. The alternative is that

at least one mean differs. ▼

The most important idea behind ANOVA is to understand the two terms:

Between

groups variance (which measures the variability of the

sample means



.)

Within

groups variance (which measures the variability of the

data within each group



.)

The null hypothesis of ANOVA is assumed to hold true when these two variances are roughly equal. It is rejected when the

between

groups variance is significantly larger than the

within

groups variance as measured by the p-value

obtained from the ANOVA F statistic and an F distribution with p_1 and p_2 degrees of freedom.