**In-Class Exercise #3 (5 minutes)**

### **How do you calculate degrees of freedom for between-group variability (df\_between)?**

A. df\_between = N - 1  
**B. df\_between = k - 1**  
C. df\_between = N - k  
D. df\_between = k + 1

### **Which formula represents the calculation of the F-statistic in ANOVA?** A. F = MS\_within / MS\_between **B. F = MS\_between / MS\_within** C. F = Variance\_between + Variance\_within D. F = Sum of squares / Total variance

1. **When would you reject the null hypothesis in an ANOVA test (with alpha = 5%)?**  
   A. When the p-value is greater than 0.05.  
   **B. When the p-value is less than 0.05.**  
   C. When the F-statistic is zero.  
   D. When the sample sizes are unequal.
2. How is the critical value of the F-statistic determined in ANOVA?  
   A. By calculating the mean of the data.  
   **B. Using the F-table with degrees of freedom and significance level.**  
   C. By dividing the total variance by the sample size.  
   D. By multiplying the group means.
3. In a one-way ANOVA test with three groups, what is the degrees of freedom for between-groups variability?  
   A. 1  
   **B. 2**  
   C. 3  
   D. 4
4. If you perform a one-way ANOVA with N = 20 participants and k = 4 groups, what are the degrees of freedom for the within-group variability (df\_within)?  
   A. 15  
   **B. 16**  
   C. 20  
   D. 4
5. If your calculated F-statistic is less than the critical value from the F-table, what should you conclude?  
   **A. Fail to reject the null hypothesis.**  
   B. Reject the null hypothesis.  
   C. Accept the alternative hypothesis.  
   D. Increase the significance level.
6. If the F-statistic is greater than the critical value, what should you conclude?  
   A. Fail to reject the null hypothesis.  
   **B. Reject the null hypothesis.**  
   C. The test is inconclusive.  
   D. The sample size is too small.
7. If the p-value is less than 0.05 in an ANOVA test, what does this indicate **(with alpha = 5%)**?  
   A. The data is normally distributed.  
   B. The sample size is too small.  
   **C. There is a significant difference between the group means.**  
   D. The F-statistic is too low.