Example Suppose we want to compare three different types of companies. Our research question is "Does the population mean annual profit per employee differ for at least two of the three types of companies?" Suppose $\alpha = .01$. We collect data and the data (in thousands of dollars) are as follows:

1=Electric Utility	2=Financial	3=Food
49.1	27.6	39.0
43.4	48.2	57.3
32.9	36.3	52.5
27.8	41.8	42.6

1. What is the null and alternate hypothesis.

2. Find SS_{BET}, SS_W, $d.f._{BET}$, $d.f._W$, MS_{BET}, and MS_W.

3. What is the F test statistic and the P-value for this test.

4. What is the decision?

5. What is the conclusion?

Example

Research Quarterly published a study that investigated the strength and endurance of female athletes. The maximum grip strength (in kilograms) of female athletes engaged in 5 different sports were compared. Assume that the populations are normal, the population variances are equal, and the samples are independent and random. The data are given in the table below:

Tennis=1	Golf=2	Basketball=3	Gymnastics=4	Swimming=5
43.5	39.5	39.2	41.2	38.3
42.5	38.5	37.5	42.5	39.4
44.2	40.1	37.6	43.5	37.1
44.3	40.8	39.5	42.1	38.5
45.1	39.1	36.5	40.7	38.9

At a 5% level of significance is the sample evidence sufficient to show that not all of the population mean grip strengths of female athletes are equal?

Example

Where are the deer? Random samples of square-kilometer plots were taken in different ecological locations of Mesa Verde National Park. The deer counts per square kilometer were recorded and are shown below.

Mountain Brush=1	Sageland Brush=2	Pinon Juniper=3
30	20	5
29	58	7
20	18	4
29	22	9

Is there sufficient sample evidence to indicate not all of the population mean deer counts per square kilometer are equal? Use $\alpha = 0.05$.

Example

A teacher predicts that students will learn most effectively with a constant background sound, as opposed to an unpredictable sound or no sound at all. She randomly divides twenty-four students into three groups of eight. All students study a passage of text for 30 minutes. Those in group 1 study with background sound at a constant volume in the background. Those in group 2 study with noise that changes volume periodically. Those in group 3 study with no sound at all. After studying, all students take a 10 point multiple choice test over the material. Their scores follow:

Constant	Sound=1	Random	Sound=2	No	Sound=3
7	9	5	7	2	1
8	7	5	2	4	4
6	6	3	6	5	4
8	8	4		1	3
6		4		2	

At a 5% level of significance, is there sufficient sample evidence to show that at least two of the means differ?