The analysis to see which lab was best (and worst) for each of the questions on the survey is an ANALYSIS of variance with a comparison of each of the groups. One of these possible types of comparisons is called "Tukey's Honestly Significant Differences." What you do is compare each of the averages of each lab using a t-test... but then you need to make an adjustment.

In this case we have video ratings from 8 labs. That means there would be 8 choose 2 = 28 different pairs of means... so we would have 28 t-tests. If each of those t-tests had an $\alpha=0.05$ we could actually have up to a 100% chance of making at least one type I error out of all those tests. (Imagine that each of the Type I errors was as close as possible to being independent and add them up...)

Below is the output for question 1:
1 - How helpful was the video for the topic presented? (5=very, 1= not at all).

```
        Means with the same letter are not significantly different.

        Tukey Grouping          Mean      Lab

                   A            4.0500     10
                   A
            B      A            3.6364     11
            B      A
            B      A            3.4783      5
            B      A
            B      A   C        3.3182     16
            B          C
            B      D   C        2.9444      2
            B      D   C
            B      D   C        2.7778      7
                   D   C
                   D   C        2.5455      6
                   D
                   D            2.2857      9
```

Lab 10 had the highest average of 4.05, followed by lab 11 at 3.64, and lab 9 was the least helpful with an average of 2.29. The problem is that these are the <u>sample averages</u>. And we want to know if the <u>true (population) averages</u> are different. Notice that labs 10, 11, 5, and 16 all share the letter A. This means that we can't tell if they are significantly different from each other in terms of helpfulness. Similarly we can't tell which of labs 2, 7, 6, and 9 are the least helpful of all the videos (they all share the letter D). We can read the output for all the other questions in the same way.

2 - Did the speaker keep your attention? (5=very much, 1= not at all).

```
        Tukey Grouping            Mean      Lab

                    A            3.9130      5
                    A
                    A            3.7273     11
                    A
             B      A            3.5000      7
             B      A
             B      A   C        3.2000     10
             B      A   C
             B   D  A   C        3.0556      2
             B   D      C
             B   D      C        2.6818     16
                 D      C
                 D      C        2.2727      6
                 D
                 D            2.0952      9
```

3 - Was the video easily understandable? (5=very, 1= not at all).

Tukey Grouping		Mean	Lab
	A	4.4091	11
	A		
	A	4.3043	5
	A		
B	A	4.1364	16
B	A		
B	A	4.0556	2
B	A		
B	A	4.0000	10
B	A		
B	A	3.9444	7
B			
B	C	3.3636	6
	C		
	C	2.9048	9

4 - Was the video easily understandable? (5=very, 1= not at all).

Tukey Grouping		Mean	Lab
	A	3.6500	10
	A		
	A	3.5909	11
	A		
	A	3.3636	16
	A		
	A	3.3478	5
	A		
B	A	3.1111	2
B	A		
B	A	2.8889	7
B	A		
B	A	2.6818	6
B			
B		2.2857	9

5 - Were visual demonstrations appropriate? (5=very, 1= not at all).

Tukey Grouping		Mean	Lab
	A	4.3182	11
	A		
	A	3.8000	10
	B	2.6818	16
	B		
	B	2.6667	7
	B		
C	B	2.0909	6
C	B		
C	B	1.8261	5
C			
C		1.6111	2
C			
C		1.2381	9

6 - Was the video logically organized? (5=very, 1= not at all)

Tukey Grouping		Mean	Lab	
	A	4.2727	11	
	A			
	A	3.9091	16	
	A			
	A	3.8696	5	
	A			
	A	3.8333	7	
	A			
	A	3.8000	10	
	A			
B	A	3.5238	9	
B	A			
B	A	3.4444	2	
B				
B		2.9545	22	6

7 - Was the video free of distractions? (5=yes, 1= no)

Tukey Grouping	Mean	Lab
A	3.7619	9
A		
A	3.6500	10
A		
A	3.6087	5
A		
A	3.1818	11
A		
A	3.0909	16
A		
A	2.8333	2
A		
A	2.8333	7
A		
A	2.7273	6

8 - Should the instructor be ashamed for showing the video? (5=yes, 1= no)

Tukey Grouping		Mean	Lab
	A	4.4545	6
	A		
B	A	3.8182	16
B	A		
B	A	3.7222	7
B	A		
B	A	3.6667	9
B	A		
B	A	3.2778	2
B			
B		3.1364	11
B			
B		3.0000	10
B			
B		2.6522	5