1
00:00:00,000 --> 00:00:04,200
For the nonparametric tests we will look at
one non-parametric test in the case where

2
00:00:04,200 --> 00:00:07,700
k is greater than 2 and we have independent
samples.

3
00:00:07,700 --> 00:00:09,700
It's called the Kruskal-Wallis test.

4
00:00:09,700 --> 00:00:16,000
It is very similar to the Wilcoxon Rank-Sum
(Mann-Whitney U) test in that we rank observations

5
00:00:16,000 --> 00:00:23,033
instead of use their magnitude, but now we
have k populations instead of just two.

6
00:00:23,033 --> 00:00:28,433
This test assumes that the distributions are
identically shaped and scaled but we might

7
00:00:28,433 --> 00:00:30,466
have a difference in the medians.

8
00:00:30,466 --> 00:00:37,232
So this is similar again to the Wilcoxon Rank-Sum
test where we had that similar assumption.

9
00:00:37,233 --> 00:00:42,999
The hypotheses are similar to the ANOVA hypotheses
except instead of being based upon the means

10
00:00:43,000 --> 00:00:44,366
they are based upon the medians.

11
00:00:44,366 --> 00:00:48,799
So the null hypothesis is that the medians
of all groups are equal and the alternative

12
00:00:48,800 --> 00:00:53,933
hypothesis is that the medians are not all
equal.

13
00:00:53,933 --> 00:00:57,733
As with all tests, were going to obtain our
data, check our conditions, and summarize

14
00:00:57,733 --> 00:00:58,733
our data.

15
00:00:58,733 --> 00:01:02,266
We must have independent random samples from
our k populations.

16
00:01:02,266 --> 00:01:06,232
So that is basically the same as the ANOVA
F-test.

17
00:01:06,233 --> 00:01:10,199
We have an ordinal, discrete, or continuous
response variable.

18
00:01:10,200 --> 00:01:14,300
Normally if we're going to be using this as
a substitute for ANOVA, we would already have

19
00:01:14,300 --> 00:01:19,900
a continuous or at least quantitative response
variable.

20
00:01:19,900 --> 00:01:24,533
We're going to assume there is only a location
shift otherwise the distribution should look

21
00:01:24,533 --> 00:01:25,533
similar.

22
00:01:25,533 --> 00:01:30,566
We should check to make sure that the distributions
are not horribly different and we're going

23
00:01:30,566 --> 00:01:34,432
to summarize the data by a test statistic
which we're not going to talk very much about

24
00:01:34,433 --> 00:01:36,066
it all.

25
00:01:36,066 --> 00:01:40,899
Basically we rank the observations similarly
to how we would have done so in the Wilcoxon

26
00:01:40,900 --> 00:01:42,000
Rank-Sum test.

27
00:01:42,000 --> 00:01:48,166
We combine all the data into one big set,
we rank the observations from smallest to

28
00:01:48,166 --> 00:01:53,899
largest, then we re-gather the ranks by which
group they came from and we use those ranks

29
00:01:53,900 --> 00:02:00,233
as a measure of how much the groups are similar
or different instead of the magnitude of the

30
00:02:00,233 --> 00:02:03,966
original values.

31
00:02:03,966 --> 00:02:09,132
For the p-value, we will allow the software
to calculate it for us and the conclusion

32
00:02:09,133 --> 00:02:11,799
will be made the same as other tests.

33
00:02:11,800 --> 00:02:17,566
We can word our conclusion in terms of the
medians of the k populations or in terms of

34
00:02:17,566 --> 00:02:23,366
the existence of a relationship between our
categorical explanatory variable X and our

35
00:02:23,366 --> 00:02:26,766
quantitative response variable Y.