Sign Test

Sign test is proposed by Dixon and mood (1946). This is the easiest method to analyze data. The sign test is a non- parametric statistical test to compare the sizes of two groups. One group is called as experimental group and the second group is called as control group but data can also be collected from two different conditions of one group. It is also called a "distribution free" test, which means the test doesn't, requires the data comes from a normal distribution. The sign test is an alternative to a one sample t test or a paired t test. It can also be used for ordered (ranked) categorical data. It's a weaker test.

The null hypothesis for the sign test is that the difference between medians is zero. For a **one sample sign test**, where the median for a single sample is analyzed,

Assumptions for the test (your data should meet these requirements before running the test) are:

1. The data should be from two samples.
2. The two dependent samples should be paired or matched.

For example, depression scores from before a medical procedure and after.
To set up the test, put your two sets of sample data into a table.This set of data represents test scores at the end of Spring and the beginning of the Fall semesters. The hypothesis is that the summer break means a significant drop in test scores.

How to Calculate a Paired/Matched Sample Sign Test

NULL HYPOTHESIS- H_0: No difference in median of the signed differences.

H_0: दो समूहों के आंकडे में कोई अंतर नहीं होगा|

ALTERNATIVE HYPOTHESIS- H_1: Median of the signed differences is less than zero.

H_1: दो समूहों के आंकडे में कोई अंतर होगा||

Step 1: Subtract set 2 from set 1 and put the result in the third column.

#	Set 1	Set 2	Set 1 – Set 2	Sign
1	443	57	386	+
2	421	352	69	+
3	436	587	-151	-
4	376	415	-39	-
5	458	458	0	NA
6	408	424	-16	-
7	422	463	-41	-
8	431	583	-152	-
9	459	432	27	+
10	369	379	-10	-
11	360	370	-10	-
12	431	584	-153	-
13	403	422	-19	-
14	436	587	-151	-
15	376	415	-39	-
16	370	419	-49	-
17	443	57	386	+

Step 2: Add a fourth column indicating the sign of the number in column 3.

Step 3: Count the number of positives and negatives.

- 4 positives.
- 12 negatives.

12 negatives seem like a *lot*, but we can't say for sure that it's significant (i.e. that it didn't happen by chance) until we run the sign test.

Step 3: Add up the number of items in your sample and subtract any you had a difference of zero for (in column 3). The sample size in this question was 17, with one zero, so n = 16.

Step 4: Find the p-value using a binomial distribution table or use a binomial calculator. I used the calculator, putting in:
r= 4, when n=16…. Then, CRITICAL VALUE FOR r is 2 (1% level of significance), and 3 (5% level of significance)

Calculated r = or < critical value for r than null hypothesis rejected and two groups are significantly different from each other.
And vice versa null hypothesis is accepted and both the groups are same.