Stat 296 Fall 2007
The Sign Test

Example: In a series of experiments on mengovirus, a microbiologist measured the growth of two strains of the virus—a mutant strain and a nonmutant strain—on mouse cells in petri dishes. Replicate experiments were run on 19 different days. The data are shown below. Each number represents the total growth in 24 hours of the viruses in a single dish.

Run	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Nonmutant strain	160	36	82	100	140	73	110	180	62	43	61	14	140	68
Mutant strain	97	55	31	95	80	110	100	100	6	7	15	10	150	44
Signed difference														

Run	15	16	17	18	19
Nonmutant strain	110	37	95	64	58
Mutant strain	31	14	57	70	45
Signed difference					

Note that there is considerable variation from one run to another. This variation between runs arises from unavoidable small variations in experimental conditions. For instance, both the growth of the viruses and the measurement technique are highly sensitive to environmental conditions such as the temperature and the CO_2 concentration in the incubator. Slight flucuations in the environmental conditions cannot be prevented, and these flucuations cause the variation that is reflected in the data. In this kind of situation, the advantage of running the two strains concurrently is particularly striking.

From: Statistics for the Life Sciences, by Myra Samuels.