CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Kevin R. Danh

Project Number
31594

Project Title
Testing the Null Hypothesis H0: u1 = u2

Abstract

Objectives/Goals
When a new medical procedure gets tested, a large population may get tested against a small trial population. Since the null hypothesis states that there should be is no difference between the result means of the two methods, the researcher hopes to reject the null hypothesis and conclude that the method he developed is the better of the two, rather than a ratio equal or worse.

How large do the two comparative groups have to be to get a fair statistical evaluation of the null hypothesis?

Methods/Materials
1. Construct a data chart of two separate model populations for comparison by coin flipping with ten groups of ten for each chart labeled population A or B.
2. Determine the ratio by comparing the amount of heads for sample A to the amount of heads for sample B.
3. In the first comparative test continue to add number of heads from each set cumulatively for each as two separate populations and divide the results from Sample B into A to get the comparative ratios; i.e., compare 10:10, 20:20, etc., until 100 datum are compared.
Examine whether H0: u1 = u2.
4. In the second comparative test, individual groups of 10 datum are compared to the larger population of 100 datum. Examine whether H0: u1 = u2.

Results

PHASE I Test POPULATION A versus POPULATION B										
SET	1	2	3	4	5	6	7	8	9	10
RATIO 1:	0.8	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.978
PHASE II Test POPULATION A mean versus POPULATION B										
SET	1	2	3	4	5	6	7	8	9	10
RATIO 1:	0.9	1.1	1.3	0.7	0.9	0.9	0.9	1.1	1.1	1.11

Conclusions/Discussion
I was trying to determine what the minimum comparative population sizes would have to be to get validation of the null hypothesis H0: u1 = u2. My results indicated that I was near that 1:1 ratio, but never truly achieved it. In the phase II aspect of the study I compared two populations: one very small and one very large. I found out that population means of 10 datum or less may not be valid for comparison against larger population means.

Summary Statement
This project examines the statistical validity of very small population groups versus larger ones with the null hypothesis.

Help Received