

Assignment 1

Due 9/23/03

- Given the five differences $D_i = \text{crossed} - \text{self}$, find the permutation distribution of the paired t -statistic

Crossed	Self	Difference($\frac{1}{8}$) D_i
$23\frac{4}{8}$	$17\frac{3}{8}$	49
12	$20\frac{3}{8}$	-67
21	20	8
22	$18\frac{5}{8}$	16
$19\frac{1}{8}$	$18\frac{3}{8}$	6

- Prepare 5 cups with milk first and five with tea first. Tell the lady what you have done. If she truly cannot tell difference, find the probability distribution of $X = \text{the number of milk first identified}$. What number(s) would convince you that she could tell the difference?
- Given the data with $n_1 = n_2 = 3$, find the randomization distribution of

$$t = \frac{\bar{X} - \bar{Y}}{S_{pooled} \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} .$$

X	2	4	3
Y	5	7	9

4. Sampling distribution approach

- Refer to problem 1. Perform a paired t test for equality against a two-sided alternative. That is, refer the observed value of the statistic to the .025 quantile of the appropriate t distribution.
- refer to problem 3. Find a 95 % confidence interval for the difference of means $\mu_1 - \mu_2$ using the appropriate t distribution.