

Paired t-test For dobberence of Mean

Consider the case when O the sample sizes are equal ie n = n = n (say), and (1) the two samples are not independent but sample observations are paired together, ie, the pair or observations (xi/yi) (8=1,2,- n) corresponds to the Same (ith) sample unit. The problem is to feet et the sample means debber significantly or not. For example, suppose we want to test the elbicacy of a particular drug, say, bus enducing sleep. Let xi and yi (1=1,2,-n) be the readings, on hours of sleep, on the i'th individual before and abter the drug is given respectively. Here custiand at applying the delberence of mean fest disussed en previous class, we apply paired t-test given below

Here we consider the increments di=xi-yi (E=1,2-- 7)

Order the neel hypothesis, Ho that increments are due to bluetuations of sampling, i.e., the drug is not responsible by these encrements

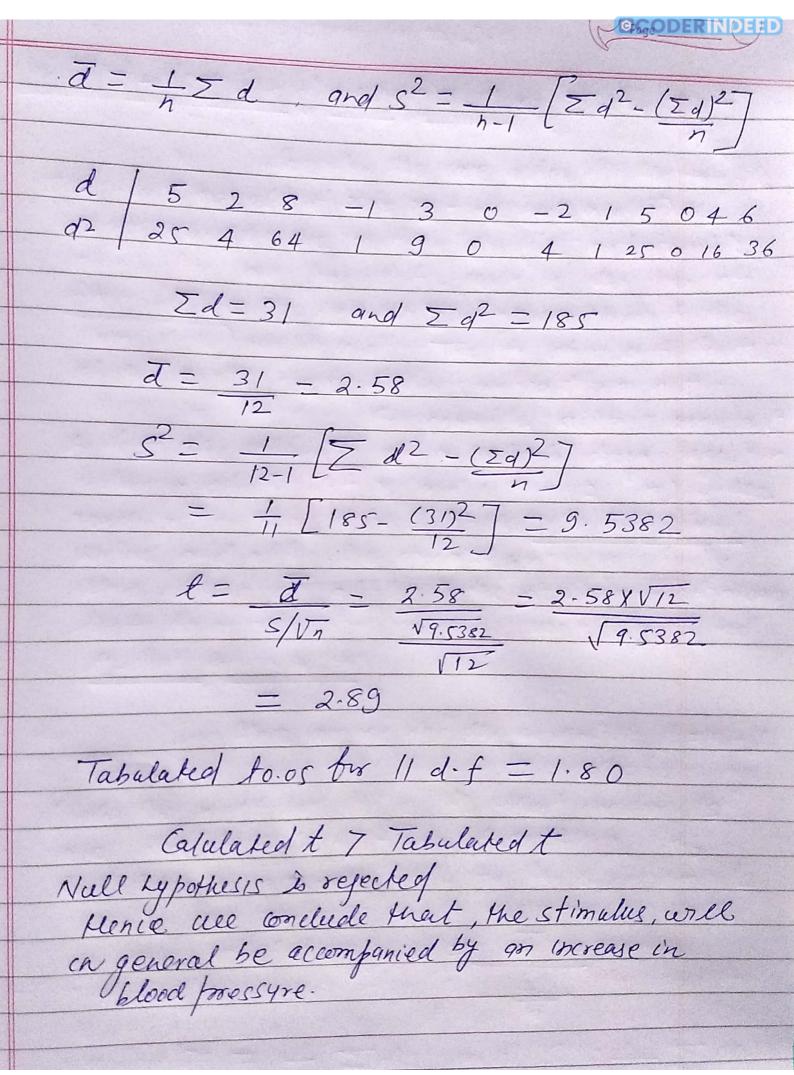
the statistic: d= d

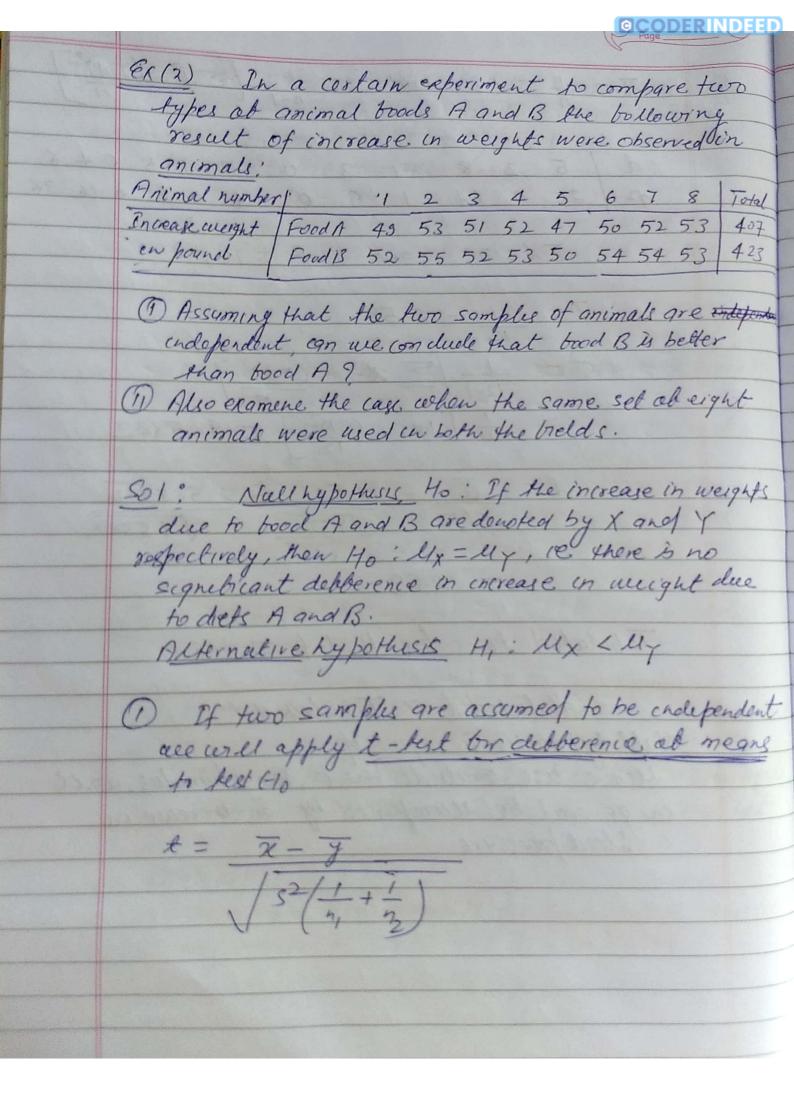
where $d = \frac{1}{n} \frac{n}{i=1} di$ and $s^2 - 1 = \frac{n}{i-1} (di-\bar{d})^2$

bullows student's t-destribution with (n-1) degree ab treadom.

lest steefistic 1 = d

S/Un





						@CODERINDE classmate
						Date Page
		od A	12	1	Food B	>'9
737.0		$\alpha = x - 50$	0 42		D=Y-52	0
3 43 15	49	7	0	52	3	9
3.80	53	3	1 19 119	55	0	
	5/	2	4	52,	1	
	52	2	9	53	-2	4
	47 50	-3 n	0	54	2	4
	52	2,	4	54	2	4
	53	3	9	53	1	
	Total	7	37	Total	7	23
	7 = 1	50+7	82.52	7 =	52 + 7	Y
	$7 = 50 + \frac{7}{8}$ $= 50.875$ $5 = 52.875$					
The same				4 1	1	
	and $\sum (x-\overline{x})^2 = \sum d^2 - (\sum d^2) = 37 - \frac{45}{8}$ $= 30.875^-$ and $\{\sum (y-\overline{y})^2 = \sum D^2 - (\sum D)^2 - n_2$ $= 23 - \frac{49}{8} = 16.875^-$ $S^2 = \frac{1}{n_1 + n_2 - 2} \left[\sum (x-\overline{x})^2 + \sum (y-\overline{y})^2\right]$ $= \frac{1}{14} \left[30.875 + 16.875\right] = 3.41$ $Tabulated foos by (8+8-2)=14 def = 1.76 t = \overline{x} - \overline{y} = 50.875 - 52.875 = -2.17 \begin{cases} 3.41 \left(\frac{1}{8} + \frac{1}{8}\right) \\ 1 + \frac{1}{12} + $					
	Since calculated t is his their 1001100					
1	rejected at 5 % level at significance. So use conclude that bood B is superior.					
1	So	e ace cor	relude that	00001 8	a superior	
基	41				C	1 11 0 0

