

QSCI 482 HW 6 KEY

Xi's					$1 - e^{-k/t}$		
	1 fi	Fi	Rel Fi	Rel Fi-hat	Rel Fi-hat - J	Rel Fi-hat - rel Fi-1	
8	1	1	1	0.1	0.1479	0.0479	0.1479
8.3	1	2	2	0.2	0.153	0.047	0.053
15.4	1	3	3	0.3	0.2651	0.0349	0.0651
20.1	1	4	4	0.4	0.331	0.069	0.031
20.5	1	5	5	0.5	0.3363	0.1637	0.0637
32.4	1	6	6	0.6	0.4769	0.1231	0.0231
58.3	2	8	8	0.8	0.6884	0.1116	0.0884
64.4	1	9	9	0.9	0.7242	0.1758	0.0758
95.1	1	10	10	1	0.8507	0.1493	0.0493

a $D_{crit} = D_{0.10}(2)$, $10 = 0.36866$

b H_0 : Survival times follow the function : $1 - e^{-t/k}$, where t denotes survival

H_a : Survival times do not follow the above exponential function

Dobs = 0.1758

Do not reject the null hypothesis at $\alpha = 0.10$.

The exponential function $1 - e^{-t/k}$, with $k = 50$ days,
can be used to model the machine component's survival time.

c $D = 0.20$, $\alpha = 0.02$ (2), $D_{crit} = 0.19930$, $n = 56$

2

a

$H_0: Y_{ij} = \mu + \epsilon_{ij}$

$H_a: Y_{ij} = \mu + \tau_i + \epsilon_{ij}$, where $\epsilon_{ij} \sim N(0, \sigma^2)$

$H_0: \mu_C = \mu_{FA} = \mu_{BP} = \mu_{NaCl} = \mu$

$H_a: \mu_i \neq \mu$ for at least one i

$H_0: \tau_i = 0$

$H_a: \tau_i \neq 0$

b

Silage	
Treatment	
Control	80.5
Control	79.3
Control	79
Control	89.1
Formic Acid	75.7
Formic Acid	81.2
Formic Acid	77.8
Beet Pulp	79.5
Beet Pulp	77
Beet Pulp	76.7
NaCl	77.2
NaCl	78.6
NaCl	

		group mean	grand mean	Ti-hats
Mean = 79.3	Control	79.6	79.3	0.3
Ti-hats	Formic Acid	82	79.3	2.7
	Beet Pulp	78.1	79.3	-1.2
	NaCl	77.5	79.3	-1.8

	$3 * (Ti-hat)^2$
SS Treatment: Control	0.27
Formic Acid	21.87
Beet Pulp	4.32
NaCl	9.72
Sum	36.18

c

Source of Variation	DF	SS	MS	F	P
Treatments	3	36.18	12.06		0.9926 $p > 0.25$
Error	8	97.2	12.15		

d

Do not reject H_0 . There is no effect of the treatment groups on mean orange pump silage

There is no need to compute confidence intervals for the individual group means because they were found not to be different