JUNE 2014 FINAL EXAM

EX 1

X	f_i	$f_i X_i$	$f_i X_i^2$	F	$X - X_i$	$(X - X_i)^4$	$f_i (X - X_i)^4$
1	41	41	41	41	-3	81	3321
2	30	60	120	71	-2	16	480
3	27	81	243	98	-1	1	27
4	47	188	752	145	0	0	0
5	32	160	800	177	1	1	32
6	41	246	1476	218	2	16	656
7	32	224	1568	250	3	81	2592
Σ	250	1000	5000				7108

a) $z = \frac{X - \bar{X}}{S} = \frac{2 - 4}{2} = \frac{-2}{2} = -1$ $\boxed{z = -1}$

$\bar{X} = \frac{\Sigma X}{N} = \frac{\Sigma f_i X_i}{N} = \frac{1000}{250} = 4$

$S = \sqrt{\frac{\Sigma f_i X_i^2}{n} - \bar{X}^2} = \sqrt{\frac{5000}{250} - 4^2} = \sqrt{20 - 16} = \sqrt{4} = 2$

b) $\boxed{Q_1 = 2}$

POSITION $= \frac{i(n+1)}{k} = \frac{1(250+1)}{4} = \frac{251}{4} = 62.75$

$\boxed{Q_2 = 4}$

POSITION $= \frac{i(n+1)}{k} = \frac{2(250+1)}{4} = \frac{2 \cdot 251}{4} = \frac{502}{4} = 125.5$

$\boxed{Q_3 = 6}$

POSITION $= \frac{i(n+1)}{k} = \frac{3(250+1)}{4} = \frac{3 \cdot 251}{4} = \frac{753}{4} = 188.25$

c) $\% = \frac{f_i}{n} \cdot 100 = \frac{32}{250} \cdot 100 = 0.128 \cdot 100 = \boxed{12.8\%}$

d) $\mu = 3$

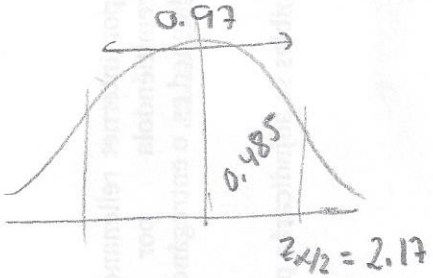
$\bar{X} = 4$

$CL = 97\%$

$H_0 : \mu = \bar{X} \rightarrow 3 = 4$

$$z_0 = \frac{\bar{X} - \mu}{\sigma_{\bar{X}}} = \frac{4-3}{0.13} = \frac{1}{0.13} = 7.69$$

$$\sigma_{\bar{X}} = \frac{s}{\sqrt{n-1}} = \frac{2}{\sqrt{250-1}} = \frac{2}{\sqrt{249}} = \frac{2}{15.78} = 0.13$$



$7.69 > 2.17$ — ~~H_0~~

The idea of the technical team is not right.

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ex 2

$$\bar{x} \pm z_{\alpha/2} \cdot \frac{s}{\sqrt{n-1}} = 6 \pm 1'96 \cdot \frac{1'41}{\sqrt{400-1}} = 6 \pm 0'14 \begin{matrix} < 6'14 \\ > 5'86 \end{matrix}$$

$n = 400$

$\bar{x} = 6$

$s^2 = 2 \rightarrow s = \sqrt{2} = 1'41$

$CL = 95\%$

ex 3

- Qualitative independent variable (two groups)
- Quantitative dependent variable
- Assumptions are accepted
- Dependent samples

→ t dependent groups

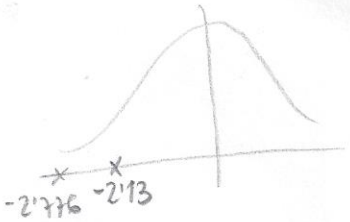
PRE	POST	d	$D-\bar{D}$	$(D-\bar{D})^2$
4	5	-1	0'6	0'36
2	5	-3	-1'4	1'96
5	4	1	2'6	6'76
4	7	-3	-1'4	1'96
7	9	-2	0'4	0'16
Σ		-8		11.2

$$t = \frac{\bar{D}}{S_0} = \frac{-1'6}{0'75} = -2'13$$

$$\bar{D} = \frac{\Sigma D}{n} = \frac{-8}{5} = -1'6$$

$$S_0 = \sqrt{\frac{\Sigma (D_i - \bar{D})^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)} = \sqrt{\frac{11.2}{5+5-2} \left(\frac{1}{5} + \frac{1}{5}\right)} = \sqrt{1'4 \cdot 0'4} = \sqrt{0'56} = 0'75$$

$$t(\alpha, n-1) = t(0.05, 5-1) = t(0.05, 4) = 2'776$$



(Ho) OTE scores do not improve significantly after the camping trip

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EX 4.

a)

	SS	df	MS	F	sig.
BETW.	1250	1 (k-1)	1250	0.65	0.43
WITHIN	34500	18 k(n-1)	1916.67		
TOTAL	35750	19 N-1			

b) There are not statistically significant differences between men and women

sig $>$ α

0.43 $>$ 0.05 — (Ho)

c) $R^2 = \frac{SS_{BET}}{SS_{TOT}} = \frac{1250}{35750} = 0.03$ (low effect size)

The effect probably does not exist