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Classmate

X ~ Whisperm (0,1) (1) @ lut

> I considered 500 X; 's. Here

y = (=x;) - 500. 42 In Var [x;]

Var [x;] = (b-a) = 12:

 $\therefore Y = \sqrt{\frac{12}{500}} \left(\leq x_i - 250 \right)$

Here Y is Mormal (0,1) by CLT.

[File QI_a.txt]

Using Y I generated 10000 data points.

Let Z = Y, 1 + Y, 1 + Y, 1 + Y, 2

Mou Y is some as about.

Z = ~ x ? (df = 4)

Using this Z make I generated 10000 data points [QZ_b.txt].



2.0 Let y = x + w where w~N(0,1)

× » Uniform (a, b) and Y is observed.

Consider the noise to be independent.

E[Y] = E[x] 4 Han [Y] = Van [x] + Van [w] - 0 = Van [x] + 1 - 2

Let v = sample Hariance of y.

m = barufil mean of y

We know both v fm are unbiased and

Ulung () f () 4 E[x] = b+a + la(x) = 6-91?

 $-1 \cdot m = \frac{1}{p+q}$ $4 \cdot v = \frac{1}{p-\alpha} + 1$

= ab+a=am $f(\sqrt{3}(0-1))=b-a$

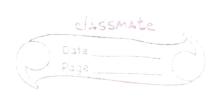
 $= m + \sqrt{3(4-1)}$ $a = m - \sqrt{3(4-1)}$

 $a = \lambda$

(b) Assuming that noise = 0 The given data referesents unfform random nariable x ~ (a, b). Let $X = (x_1, x_2, \dots, x_n)$ guin data Let $\vec{b} = \text{max}(x_1, x_2, \dots, x_n) = \vec{X}_{n}$ $\hat{a} = \min (x_1, x_2, \dots, x_n) = \vec{x}_n$ $P(\vec{X}_{max} < n) = P(X; < n) = TP(X; < x)$ $\frac{1}{2} \int_{max} (n;b) = \begin{cases} \frac{n}{2} + \frac{n}{2} \end{cases}$ b. O otherwis $\overline{E[X]} = \int \frac{n}{n} \frac{n}{n} \frac{n}{n} = \frac{nb}{n+1}$.. b' = n+1 x' mar is unbeased and consistant

they bir = m+1 7 ming is heard and consistant

discourse



$$M = 0.088$$
 $M_a = -0.075$

$$y = -0.457$$
 $y = -0.457$
 $y = -0.457$

$$\left[\frac{(n-1)s^2}{\chi^2_{\frac{1}{2},n-1}},\frac{(n-1)s^2}{\chi^2_{\frac{1}{2},n-1}}\right] = \left[\frac{g.377}{3.377},26.921\right]$$

We can diduce that sample belongs to population 2.



6 Let 4 = -0.075 4 = -0.457 = 43

Ho! U = Ma H,: 4 + Ma.

let T = 14/-1/2 = 0.698.

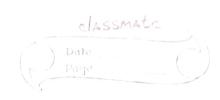
 $t_{\kappa} = 2.01$ where $\kappa = 0.05$

Ne see T < tax we succept H,

F-test performed by F= min(ai, add)

min(ai, add)

Using significance level 0.6, we get an inluval for in: 4-18.



4 (a) Generating unfaform normal data N(0,1) and appending it to the file.

a File Q4_a.tot fas 3 columns.

ulhere F = MSE;

Since 'k' can be anything, I have

printed b-value for the test.

6 Spearmon Range correlation coefficient

 $|P=|-\frac{6 \leq di'}{n(n'-1)}|$

de = defference in names of data in both columns.

I have fruited the 's' value and & - value for the test.