Assignment 3.

Enerelse 4.1

a) Find the consentance con (x, y).

cov (x,y) = E (ne-u(x)) (ye-u(1))

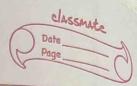
= E((X-M(X))(Y-M(Y)) = -184.69

| | | | | | 11. |
|---|----------|--------|-----------------|----------|------------------|
| 1 | X | Y | $\times -10(x)$ | Y-U(Y) | X-11(X)(X-11(X)) |
| | 45 | 5 | 17.1429 | -17.1429 | -29308776 |
| | 10 | 30 | -17.8571 | 7-8571 | -146-3061 |
| | 25 | 20 | -2.8571 | -2.1429 | 6.1224 |
| | 40 | 10 | 12.1429 | -12-1429 | -147.4490 |
| | is | 40 | -12.8571 | 17-8571 | -229.5918 |
| | 55 | 15 | 27.1429 | -7.1429 | -193.8776 |
| | 5 | | | 1208571 | -293.8776 |
| | | 33 | -22.857 | 12.03 17 | -184.6900 |
| U | 1 470 85 | 22-143 | | | |

) Find the conservance account median cong (X, Y).

Cove (x,x) = {=1 (ne-up(x)) (ye-up(x))

= E (X-Me(*)) (Y-Me(X)) = -178057



| | × | ¥ | X-40(X) | Y-le(x) | (x-up(x)) (y-up(x)) |
|---|-----|----|-------------|-----------|---------------------|
| | 45 | 5 | 20 | -15 | -300 |
| | 10 | 30 | -15 | 10 | -120 |
| | 25 | 20 | 0 | 0 | 0 |
| | 40 | 10 | 15 | -10 | -150 |
| | 15 | 40 | -10 | 20 | -200 |
| | 55 | 15 | 30 | -5 | -150 |
| | 5 | 35 | 20 | 15 | -300 |
| u | 125 | 20 | 1) (1-12(d) | MITTER DE | -178-57 |
| | | | | | |

c) Find the Reason consulation coefficient p (*, y)

$$(\text{ov}(X,Y) = -184.69$$

 $6(X) = 17.699$
 $6(Y) = 12.206$
 $p(X,Y) = (\text{ov}(X,Y))$
 $6(X) 6(Y)$

= - 184.69 17-699× 12-206

= -0.8549

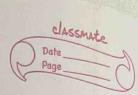
d) Find the concordance conscillation coefficient $\rho_c(x,y)$ (ov(x,y) = -184.69 ll(x) = 27.857 ll(x) = 22.143 $6^2(x) = 313.27$

6 (x)= 3|3,27 6(x)= 148.98

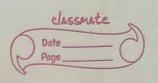
 $\rho_{c}(X,Y) = \frac{2\omega Y(X,Y)}{6^{2}(Y) + 6^{2}(Y) + (U(X) - U(Y))^{2}}$



| | | | | ~ | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| | = 2x-184.69 | | | | | |
| | 313029 + 148098 + (270857- 120143)2 | | | | | |
| 2-0.8599 | | | | | | |
| | | | | | | |
| 100 | I the Speasur | ran signk | concelation | nethod . | | |
| Pr | nellectent po | (x, y) | | | | |
| | 13 | | China di | THE REAL PROPERTY. | | |
| X | 7 | R(x) | R(x)_ | | | |
| 45 | | 6 | 1 | | | |
| 10 | 30 | 2 | 5 | | | |
| 25 | 20 | 4 | 4 | A STATE OF THE STA | | |
| 40 | 40 10 | | 2 | | | |
| | | | 7 | | | |
| | 15 | 3 | 3 | | | |
| 5 | 35 | | 6 | | | |
| | ρs (X,Y)= ρ(R(X), R(Y))= -0.7857 | | | | | |
| | Ps (A | ,1) = P(N) | N) , K(1)/- | 109 | | |
| | 2 - | 6 | C (R(n:) - | R (48))2 | | |
| 1 4 | $= 1 - 6 = \frac{R(n_i) - R(y_i)}{R(n_i^2 - 1)}$ $= 1 - 6 = \frac{R(n_i) - R(y_i)}{R(y_i^2 - 1)}$ | | | | | |
| | | | | | | |
| | 2 - | 6 | ×100 =-0.783 | 57 | | |
| | 7X (72-1) | | | | | |
| | | | 1 00.12 | | | |
| | R(X) R(Y) (R(X) - R(Y)) | | | | | |
| | 6 | | 25 | | | |
| | 2 5 | | 9 | | | |
| | <u>4</u> 5 5 | | 9 | The state of the s | | |
| | | 7 | 16 | TABLE DESCRIPTION | | |
| | 7 3 | | 16 | | | |
| | 1 | 5 | 25 | | | |
| | The Control of the Co | ٤ | = 100 | | | |
| | | | | | | |



| 0 | Fend the Kendall wank convelation coeffectent, TCXX | | | | | | |
|-----|--------------------------------------------------------------------------|--|--|--|--|--|--|
| | Vo 11 1 1 | | | | | | |
| | Kendall's fay, T | | | | | | |
| | x' y' R (x') R (y') | | | | | | |
| | 5 33 1 6 | | | | | | |
| . 9 | 10 30 2 5 d | | | | | | |
| | 15 40 3 7 EC 25 20 4 4 d d d | | | | | | |
| | 40 10 5 2 dddd | | | | | | |
| | 45 5 6 1 ddddd | | | | | | |
| | 33 13 17 3 dddd ce | | | | | | |
| | C=4 and $D=17P(X,X)=C-D=9-17=0.619$ | | | | | | |
| | | | | | | | |
| | C+D 4+17 | | | | | | |
| | F72450 - 6(1) - 6(1) - 6:4157 | | | | | | |
| | Enercise 4.2. | | | | | | |
| a) | Find the vacilance values 62 (X1240) and 62 (X1240). | | | | | | |
| | 6 ² (V) = (1) (6 ² / ₁ / ₂) | | | | | | |
| | 62(X1vn)= (n-1) (62(X1vn-1)+U(X1vn-1)2)+np2 | | | | | | |
| | - 11 (X122) ² | | | | | | |
| | 300 4411 7 | | | | | | |
| | 62(X1~40)=39×(3871.5+282.1792)+2552 | | | | | | |
| | | | | | | | |
| | = 379205 & 372908 | | | | | | |
| | | | | | | | |



$$\frac{6^2(1/1000)}{40} = 39 \times (140.6 + 28.744)^2 + 16^2 - 28.425^2$$

≥ 141.07 2 141.04

b) Find the mean values, u (XIN40) and u (YIN40)

M(Xxn)= (n-1) M(X/2011-1) +14n

XI (X/240) = 39×2820179+255 = 28105

M(Y/20) = 39x 28.744+16 =28.425

c) France continue (X/140 , Y/140)

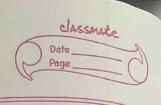
(n-1) (au (X100-1) / 100-1)+ ll (X100-1) ll (X100-1))

+U(xpn)u(xpn)

Ou (X/140) / 1440) =

39× (716.71+282.0179×28.744)+255×16 -281.5 ×28.0425

= 707·33 × 707·24.



d) Find the concellational coefficient p (XINHO, YINHO).

= 707·33 = 0.967 \[\sqrt{3792.5 \times 141.07} \]

e) Find the concordance concelation coeffectent

 $P_{C}(X,Y)^{2}$ $\frac{2 \text{cov}(X,X)}{6^{2}(X) + 6^{2}(Y) + (u(X) - u(Y))^{2}}$

= 2x707.33 3792.5+141.07+(281.5-28.425)2

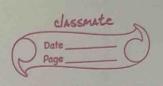
= 0.62081.

a) Ford the mean values, u(x) and u(x).

u(X) = nau(Xa) + nbu(Xb)
na+nb

M(X)= 100 X1.0579+152X 10054=1.0555 8100556

el (Y)=100×18.191+152×19.7822=19.1508 × 19.1508



6) Fond the vaculance values, $\sigma^2(X)$ and $\sigma^2(Y)$.

 $6^{2}(x) = n_{a} (6^{2}(x_{a}) + u(x_{b})^{2}) + n_{i}(6^{2}(x_{i}) + u(x_{b})^{2}) - u(x_{i}^{2})^{2}$ $n_{a} + n_{i}$

62(x)=100x (4.1948+10-4+1.05792)+152x(3.1603x10-4+1.054)

-1.05552

= 3.6072 ×10-4 23.0676 ×10-4

62 (Y)=100X (80.763+18.191)+152X (61.593+19.78222)

) _____

- 19.1512

= 69.7579 269.7579

cov (X, Y) = covaerfance, cov (X, Y).

na (cov (xa, ya) + U (xa) U (Ya) + na (cov (xb, y) + U (xc) U (yb)

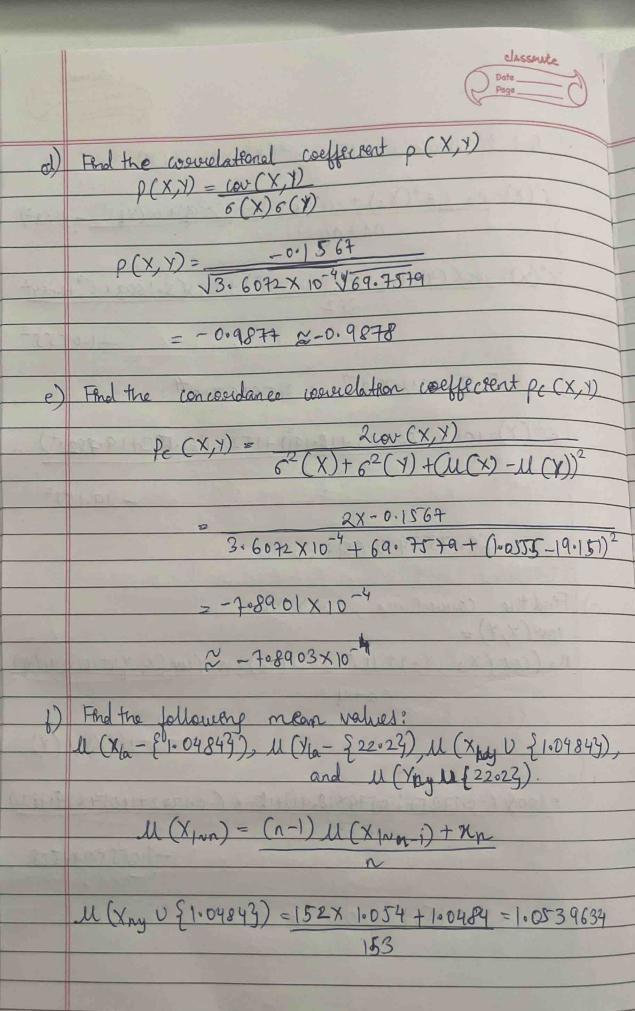
na + nb

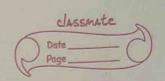
-U(X)U(X).

= 100× (-0.1795+1.0579×18.91)+152× (-0.1392+1.054×19.7822)

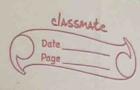
-1.055 5×19.1508

= -0.1567 N-0.1567

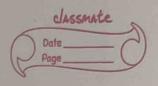




g) Find the following variance values:



62(X|Nn-1)=n(62(X|Nn)+112(X|Nn))-n2-12(X|Nn) 62 (Xea-[1004843]=100x (4.1948x10-4-1005792) -1.0582 = 4.1425 NO-4 2 4.2279 X10-4 62(Y1a- {22.23)=100×80-763+18.1912)-22.22-18.15052 h) Find the following covariance values:
(ov (X1a-{1.0484}, X1a-{22.23}) and Cov (Xmy V {1.04849, Ymy V {22023) Cov (Xpund, Ypun) 2 (n-1) (cov (xpon-1) / 100-1) + 11 (xpon-1) Ll (xpon-1) + 0/2 yn -U(XInn)U(YINN) Cov (Xny) U {1004844 Yny U (22023)= 152(-0.1392+1.054×19.7822)+1.0484×2202 - 1.0539634× 19.798 = = 0.1384 (or (Mona) Ylana) = n (cov (xjan, xjan) + ll(xjan) u (xjan))- nnyn = ll (xjan) ll(xjan)



| Cor (Xia - | 51004894 | Y10 - | £22.29 |) = |
|------------|----------|-------|--------|-----|
| | 3/ | COC | | |

100 (-0.1795+1.0579 × 18.191)-1.0484 × 22.2 - 1.058×10.1505

= 0.181 N 0.1809