

Lecture 42

42-1

HW7: 1 ellipse fit : GLS

Structure of GLS progr.

 n, n_0, r, u, c x_{obs}, y_{obs} W, Q $x_{obs}, y_{obs} \rightarrow \mathcal{L}$ $l^0 = l$ parameter approximations $a =, b =, \theta =, \dots$

while (--)

A = zeros (c, n)

B = zeros (c, m)

f = zeros (c, 1)

 $l^0 \rightarrow x, y$ form A, B, f $A: \frac{\partial f}{\partial x}, B: \frac{\partial f}{\partial x}, F$ $f = -F - A(l - l^0)$ solve $\delta = N^{-1}t$

update parameters

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$$K = W_e(f - B\delta)$$

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$$V = Q A^T K$$

$$l_{prev} = l^0$$

$$l^0 = l + v$$

if want $\Delta l = l^0 - l_{prev}$

check convergence

end

global test

error prop

$$Q_{uv} = Q A^T W_e A Q - Q A^T W_e B B^T W_e A Q$$

$$Q_{\hat{e}\hat{e}} = Q - Q_{uv}$$

$$\sum_{\hat{e}\hat{e}} \hat{\sigma}_e^2 = \sigma_e^2 Q_{\hat{e}\hat{e}} \quad \text{if pass}$$

$$\sum_{\hat{e}\hat{e}} \hat{\sigma}_e^2 = \hat{\sigma}_e^2 Q_{\hat{e}\hat{e}} \quad \text{if not pass}$$

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Exam Review

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Basics : weights,
I/O, o/o
linear / nonlinear
residuals
parameters
condition eqn's

Since Last Exam

E.P.

global test 1 side / 2 sides

$$Q \rightarrow \Sigma \quad \sigma_0^2, \hat{\sigma}_0^2$$

distn : z , normal, MVN, χ^2 , t , F conf. interval z , t

conf ellipse

$$\lambda = \frac{\sigma_x^2 + \sigma_y^2}{2} \pm \left[\frac{(\sigma_x^2 - \sigma_y^2)^2}{4} + \sigma_{xy}^2 \right]^{1/2}$$

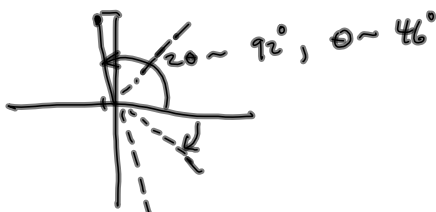
$$\begin{pmatrix} \sigma_x^2 & \sigma_{xy} \\ \sigma_{xy} & \sigma_y^2 \end{pmatrix}$$

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$$2\theta = \arctan\left(\frac{2\sigma_{xy}}{\sigma_x^2 - \sigma_y^2}\right) \quad 42-4$$

$$\arctan\left(\frac{2\sigma_{xy}}{\sigma_x^2 - \sigma_y^2}\right)$$

$$\left(\frac{.008}{-.0003}\right)$$




E.P. $y = Ax + b$ A, b constant
 Σ_{xx} given

$$\Sigma_{yy} \text{ ???}$$

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$$V + B_0 = f$$
$$\vdots$$
$$Q_{00} = N^{-1}$$

GLS counting
constraints
Sep LS



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