

① $y_i = \text{interp1}(x, y, x_i, 'spline');$

② function $z = \text{zeros_poligonal}(x, y)$

$n = 0;$

for $i = 1: \text{size}(x, 2) - 1,$

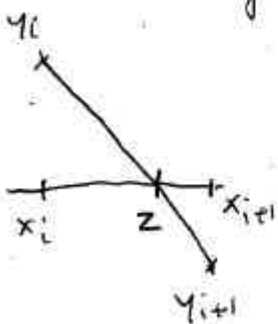
if $y(i) * y(i+1) < 0$ % detecta cambio de signo

$n = n + 1;$

$z(n) = x(i) - (x(i+1) - x(i)) * y(i) / (y(i+1) - y(i));$

end;

end;



③ Función F:

function $z = \text{mod2}f(u)$

$x = u(1);$

$y = u(2);$

$z = (y^2 - x * (x+1) * (x-1))^2 + (x - \exp(y) + y + 1/2)^2;$

Comanda en la finestra principal de Matlab:

$u_{\min} = \text{fminsearch}(@\text{mod2}f, [1; 0])$

Suposo x, y en fila

$$(4) (i) A = [\text{ones}(\text{size}(x')), x' * \exp(x'), x' * x' * \exp(x')]$$

$$a = A \setminus y'$$

$$\hookrightarrow \text{conté } a = \begin{pmatrix} a_0 \\ a_1 \\ a_2 \end{pmatrix}$$

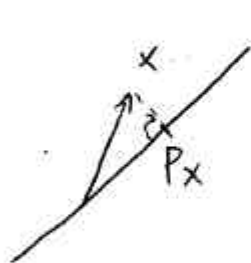
$$(ii) \|\Delta a\| \leq \|A^{-1}\| \cdot \|\Delta y\| \leq 0.01$$

$$\Rightarrow \|A y\| \leq \frac{0.01}{\|A^{-1}\|} \quad \text{Prendre } \|\cdot\| = \|\cdot\|_{\infty}$$

Com A no és quadrada, usem la pseudo-inversa: $\|A^{-1}\| = \text{norm}(\text{pinv}(A), \text{inf})$

(5) Per definició, si P = la projecció ortogonal

$$\|P\| = \max_{\|x\|=1} \|P x\| = \max_{x \neq 0} \frac{\|P x\|}{\|x\|}$$



F La projecció Px sempre té norma $\leq \|x\|$

(Una de Pitàgores: $x = Px + x^\perp$,

$$\|x\|^2 = \|P x\|^2 + \underbrace{\|x^\perp\|^2}_{\geq 0} \quad)$$

Si $x \in F$, $Px = x$.

$$\text{Per tant } \|P\| = \max_{\|x\|=1} \|P x\| = 1$$