

UNIVERSIDAD NACIONAL DE INGENIERÍA FACULTAD DE CIENCIAS ESCUELA PROFESIONAL DE MATEMÁTICA Análisis de Modelamiento Numérico I

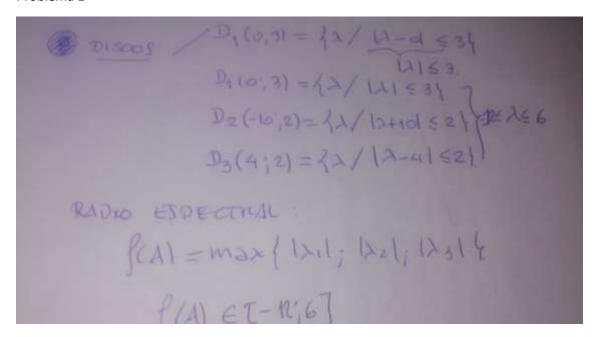
Ciclo 2020_01

Fecha: 09/09/2020

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Solucionario de la Practica Calificada No.6

Problema 1



Problema 2

$$A = \begin{bmatrix} 4 & -1 & 1 \\ -1 & 3 & -2 \\ 1 & -2 & 3 \end{bmatrix}; \quad x_0 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$Y_1 = A x_0 = \begin{pmatrix} -4 \\ -1 \end{pmatrix}; \quad Q_1 = 4$$

$$X_1 = \frac{Y_1}{G_1} = \begin{pmatrix} -1/4 \\ 1/4 \end{pmatrix}; \quad X_2 = A x_1 = \begin{pmatrix} -0.5 \\ 0.5 \end{pmatrix}; \quad C_2 = 4.5$$

$$X_3 = \frac{A x_2}{G_3} = \begin{pmatrix} -0.7 \\ 0.7 \end{pmatrix}; \quad G_3 = 5.0$$

$$V_1 = A x_2 = \begin{pmatrix} -0.7 \\ 0.7 \end{pmatrix}; \quad G_3 = 5.0$$

$$V_2 = \frac{A x_2}{G_3} = \begin{pmatrix} -0.7 \\ 0.7 \end{pmatrix}; \quad G_3 = 5.0$$

$$V_3 = \frac{A x_2}{G_3} = \begin{pmatrix} -0.7 \\ 0.7 \end{pmatrix}; \quad G_3 = 5.0$$

$$V_4 = \begin{pmatrix} -1 \\ 0.7 \end{pmatrix}; \quad V_4 = \begin{pmatrix} -1 \\ 0.7 \end{pmatrix}; \quad V_5 = \begin{pmatrix} -1 \\ 0.7 \end{pmatrix}; \quad V_7 = \begin{pmatrix} -1 \\ 0.7 \end{pmatrix}; \quad V_8 =$$

Problema 3

Let $P_m(x)$ be the polynomial that passes through

$$(x_0, f(x_0)), \ldots, (x_m, f(x_m)).$$

Then, the function

$$f(x) - P_m(x)$$

has m + 1 zeros at x_0, x_1, \dots, x_m . So,

$$f'(x) - P'_{m}(x)$$

has m zeros.

$$f''(x) - P''_m(x)$$

has m-1 zeros, and so on.

$$f^{(m)}(x) - P_m^{(m)}(x)$$

has one zero. Denote that zero by ξ .

$$f^{(m)}(\xi) = P_m^{(m)}(\xi)$$

 $P_m(x)$ is a polynomial of order $\leq m$. Therefore,

$$P_m^{(m)}(x) = m! f[x_0, \dots, x_m]$$

(Recall $f[x_0, ..., x_m]$ is the leading coefficient.) We get

$$f^{(m)}(\xi) = P_m^{(m)}(\xi) = m! f[x_0, \dots, x_m].$$

Problema 4

Algoritmo 1

Determina las diferencias divididas de un grupo finito de datos

Algoritmo 2

Usando el algoritmo 2 determina el polinomio interpolador del grupo de datos

Problema 5

USIND LOS MINS ADECUDADOS

NO = 160, XI = 170, X2 = 180

OBJENNETIOS EL POLLHORIO EN X = 162.

D(62) = 39,276 V

ES CATISFACTORIO

LON ELPOR APPOXIMANO E(162) = 0,596).