Métodos Númericos

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1 First Homework

Let be $A \in M_n$ a symetric matrix. Given a initial yector $u_0 \in R^n$, one builds the following scalar sequence and vector sequence:
$v_{i+1} = \frac{Av_i}{\|Av_i\|}$ with $i \in N$ and $v_0 = \frac{u_0}{\|u_0\|}$

$\alpha_i = (AV_i, V_i), i \in N_i \cup \{0\}$

Do the following activities:
(1) Develop an algorithm for building de sequence $\{v_i\}_{i \in D \cup \{0\}}$ and $\{\alpha_i\}_{i \in N \cup \{0\}}$
(2) Make the programming on Matlab.
(3) Analyze the results and compare them with the classic power method.

Algoritmo:
Entradas:
Matriz: $A_{nxm} \in M_n$
Vector: $u_0 \in R^n$
Primera iteración $i = 0$
$V_0 = \frac{u_0}{\|u_0\|}$
Output: $\alpha_0 = (A_{0+1}), 0$
Segunda iteración: i=1 .... i=n
$V_{1+1} = \frac{Av_2}{|Av_2|}$ With i $\in N$
Output: $\alpha_1 = (A_{v1}, V_1), 0$