

University of Central Florida
Department of Electrical Engineering and Computer Science
COT 4500 Numerical Calculus
Assignment 4 (Spring 2013)

Due on April 7th.

For all exercises show all your work step by step.

Given the following sparse matrix A , and vectors y and x :

$$A = \begin{bmatrix} 1 & 0 & 0 & 2 & 0 \\ 3 & 4 & 0 & 0 & 0 \\ 0 & 5 & 6 & 0 & 0 \\ 7 & 0 & 8 & 9 & 0 \\ 0 & 0 & 10 & 0 & 11 \end{bmatrix}, y = \begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \end{bmatrix}, x = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{bmatrix},$$

- 1.- Write the algorithm to compute $y = Ax$ using the CSR format. Show the data structures and the trace for each iteration. (25 points)
- 2.- Write the algorithm to compute $y = Ax$ using the JDS format. Show the data structures and the trace for each iteration. (25 points)
- 3.- Write the algorithm to compute $y = Ax$ using the CCS format. Show the data structures and the trace for each iteration. (25 points).
- 4.- Write the algorithm to compute $y = Ax$ using the TJDS format. Show the data structures and the trace for each iteration.(25 points)

You can read on JDS and TJDS on this URL:

<http://www.cs.ucf.edu/eurip/publications/lncs.publication.iscis03.pdf>

How to submit: Sent an email (before 11:59 p.m.) to Frank Plochan with an attachment containing the Latex file and the PDF file (fplochan@gmail.com file).

Do not forget:

- a) Handwritten assignment will to be accepted.
- b) show all the steps (all the work). Submissions with only the final result will not be accepted.
- c) Submit a latex file along with the pdf file.