

UCF

School of Computer Science CDA 4150 Computer Architecture Spring 2005

Homework 2 (Due 3/25/05)

1.- Go to the Matrix Market website

<http://math.nist.gov/MatrixMarket/>

2.- Download the data for the IBM32 matrix and create the IBM32 sparse matrix(all the non-zero values are ones).

<http://math.nist.gov/MatrixMarket/data/Harwell-Boeing/smtape/ibm32.html>

3.- Multiply the IBM32 matrix by a vector X (with all its elements equal to one) using the standard matrix vector multiplication algorithm. **Counts the total number of operations executed(multiplications and adds), and the number of operations executed using non zero values.**

4.- Goto the URL:

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

and read about the TJDS format.

5.- Compressed the IBM32 matrix into the TJDS format and execute the matrix vector product, $y = Ax$, using the matrix in the TJDS format. **Count the number of operations executed.**

6.- Turn in a report comparing the two approaches.

You must deliver in an envelope: a floppy with the programs, the resulting output from each program, and the report.

Note from TA:

Only count the total number of operations executed for matrix vector multiplication, other auxiliary operations should not be counted, i.e. the operations used to get TJDS format, adds used for index increment should be excluded from your count number.

Clearly separate your count about multiplications from additions.

Floppy is not required, **please send** your zipped sourcecode file to jfkong@cs.ucf.edu. The file should be named **YourLastName_YourFirstName_HW2.zip**)