

COP 5537 - Assignment 3 Pseudocode

File is read in (A.txt), declare our adjacency matrix as A," a 2d int array, initialize all helper variables.

For each row in our matrix, fill with the corresponding row from the A.txt file.
Get startIndex from user.

Run PageRank algorithm with method "PageRank(A, dampingFactor, convergenceCriteria)" which requires the previously built matrix and given dampingFactor equal to 0.79 and convergenceCriteria equal to $1 * 10^{-5}$.

PageRank(A, dampingFactor, convergenceCriteria):

First initialize every element of the webpageRank array with an initial rank to 1/100 ($1/N$ where N is the number of webpages).

Call updatePageRank method:

While the difference of the old page rank and new page rank is less than the convergence criteria:

1. If there is an edge at this vertex, count how many there are.
2. Update the webpage index at this index with the sum of itself and the result of the decay equation:
 - a. If the degree of this edge is 0:
 - i. The page rank at this index will now be:
$$itself + (dampingFactor * \frac{old\ rank}{N}) + \frac{1 - damping\ factor}{N}$$
 - b. If the degree is greater than 0:
 - i. The page rank at this index will now be:
$$itself + (dampingFactor * \frac{old\ rank}{number\ of\ edges}) + \frac{1 - damping\ factor}{N}$$

Pass elements of the webpageRank array to output arraylist and sort by page rank.

Display results by writing contents of output array list to assignment3_output.txt.