COP 5537 ASSIGNMENT #3

1 Pseudocode for PageRank Algorithm

Algorithm 1 PageRank(Adjacency matrix **A**, Damping factor **d**, Convergence criterion **ε**, Number of web-pages **n**)

for i ← 1 to n **do** ▷ Initialize PageRank score for all the web-pages
    R_cur[i] ← $\frac{1}{n}$
indegree[x] ← list of nodes that have directed edge towards node x
outdegree[x] ← list of nodes that have directed edge from node x
OutDeg[x] ← length of outdegree[x]

for iter_no ← 1 to max_iter **do**
    for page ← 1 to n **do** ▷ Updates PageRank score for all the n web-pages
        R_next[page] ← $\frac{(1-d)}{n} + d(\frac{R\_cur[T_1]}{OutDeg[T_1]} + \frac{R\_cur[T_2]}{OutDeg[T_2]} + ... + \frac{R\_cur[T_l]}{OutDeg[T_l]})$ ▷ T_1, T_2, ..., T_l represent the list of nodes that have directed edge towards node 'page', T_l = indegree[page][l]
    if $\sum_{j=1}^{n} |R\_next[j] - R\_cur[j]| < \varepsilon$ **then**
        break ▷ Reached Convergence
    R_cur = R_next ▷ Not converged yet, so updates current PageRank score and continues to iterate until reaches convergence or max_iter
return iter_no, R_next