TE Comp-V	**Lab Experiment : 10**	Date of Submission :
Name:		**Roll number :**

Course outcomes: On successful completion of course learner will be able to:

Proficient in applying Page rank/HITS algorithm.

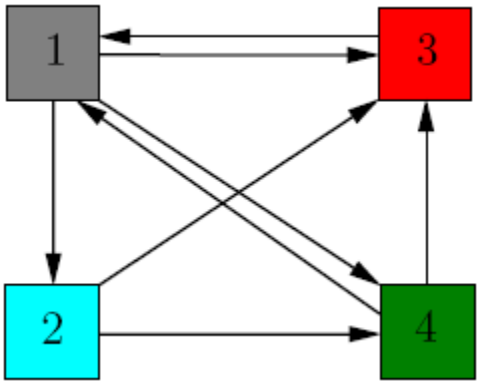
Rubrics for assessment of Lab Experiment :

Indicator	Average	Good	Excellent
Timeline ● On time Completion & Submission (02)	Late submission (0)	01 (On Time)	02 (Before deadline)
Understanding of Concept (2)	Demonstrates thorough understanding of the underlying data structure and its use. (2)	Understands the concept but lacks depth in explanation or application. (1)	Basic or poor understanding; unable to relate the concept to the problem. (<1)
Implementation Perform Page rank/HITS algorithm (4)	< 60% complete (2)	< 80% complete (3)	100% complete (4)
Knowledge ● In depth knowledge of the post assignment questions (2)	Unable to answer 2 questions(0)	Unable to answer 1 question (1)	Able to answer 2 questions (2)
Understanding of Concept (2)	**Implementation (4)**	**Timeline (2)**	**Knowledge (2)**

Teacher's Sign : **Total (10):**

Aim Implementation of Page rank/HITS algorithm

Objective: WAP to implement Page rank algorithm for a given graph and HITS algorithm



References:

http://pi.math.cornell.edu/~mec/Winter2009/RalucaRemus/Lecture3/lecture3.html

PageRank - Wikipedia

http://www.cs.princeton.edu/~chazelle/courses/BIB/pagerank.htm

https://www.youtube.com/watch?v=3_1h13PJkUs

Algorithm

Part 1: Simple

I/P- initial graph –READ/DEFINE THE MATRIX matrix and (N –no of nodes

0

O/P- find page rank vector and k- no of iterations.

1) PASS MATRIX-A TO PAGE RANK FUNCTION

2) initial vector V_0= [1/n, 1/n, 1/n..ntimes]-Print V0

3) LOOP i=1 TO CONVERGE

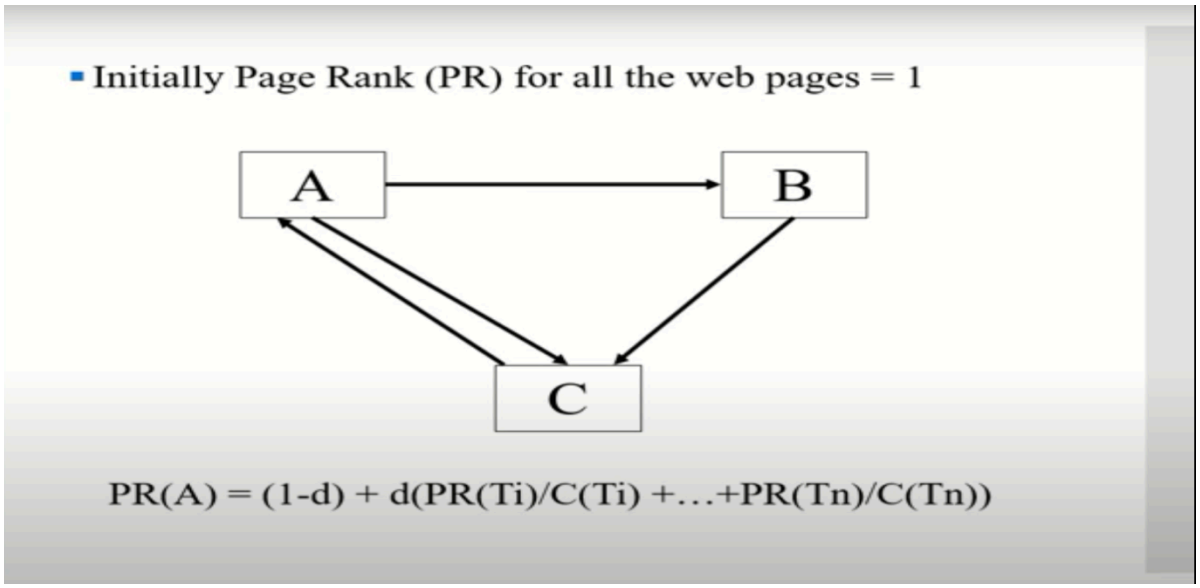
$V_i = A * V_{i-1}$

i=i+1;

Iterate until converge V or i steps (COMPARE if(Vi = Vi-1) then stop)

4) return (Print)Vi and i- no of iterations

Part 2: Web Surfer Algorithm (Damping Factor=0.85)-



Page Rank Algorithm and Implementation - GeeksforGeeks

Page Rank - Wikipedia

Part 3: HITs algorithm

HITS Algorithm - Hubs and Authorities on the Internet

Hyperlink-Induced Topic Search (HITS) Algorithm using Networxx Module - Python

Hyperlink Induced Topic Search (HITS) Algorithm using Networkx Module | Python - GeeksforGeeks

HITS Algorithm: Link Analysis Explanation and Python Implementation from Scratch | by Chonyy | Towards Data Science

Lab Questions

1) Give the efficient approach to handle M and write reason

2) Give improvement of Page rank algorithm for spider trap problem and dead end

Conclusion: I have successfully performed Page rank and Hit Algorithm.

Other references:

- Web Mining (tutorialride.com)
- Web Mining and Text Mining - An In-Depth Mining Guide (eduonix.com)
- Hyperlink Induced Topic Search (HITS) Algorithm using Networxx Module | Python – GeeksforGeeks
- PageRank Algorithm - The Mathematics of Google Search (cornell.edu)
- Google's PageRank Algorithm: Explained and Tested (link-assistant.com)
- HITS Algorithm - Hubs and Authorities on the Internet (cornell.edu)
- HITS Algorithm: Link Analysis Explanation and Python Implementation from Scratch | by Chonyy | Towards Data Science