Quiz 2

Wednesday, May 12, 2021 4:55 PM

Question 1 — 10 points — Save Answ

The PageRank algorithm iteratively multiplies the matrix **M** representing the graph structure of the Web to the vector **v** representing the distribution of a 'random web surfer' location. The final value of **v** is equivalent to which of the below

- a. 1st Singular Value of **M**
- b. 1st Eigenvalue of **M**
- c. 1st Eigenvector of **M**
- d. 1st Derivative of **M**

Question 2 — 10 points — Save Answer

The graph structure of the Web in the PageRank framework can be represented by a matrix, where each column contains **k** non-zero elements with value **1/k**, representing a transition away from a given web page represented by a vertex. The value of k is determined by which of the below

- a. Vertex In-Degree
- b. Vertex Out-Degree
- c. Page TF-IDF
- d. Page Length

Question 3 — 10 points — Save Answer

The PageRank algorithm assigns a real number to each web page that is processed, with a higher PageRank score implying that a given web page is which of the below

- a. Higher TF-IDF
- b. Lower TF-IDF
- c. More important
- d. Less important

Question 4 — 10 points — Save Answer

The actual structure of the Web, as opposed to the ideal version in the PageRank framework, results in issues for the PageRank algorithm due to which of the below

- a. Dead Ends
- b. Both Dead Ends and Spider Traps
- c. Neither Dead Ends nor Spider Traps
- d. Spider Traps

Question 5 — 10 points — Save Answer

Within the PageRank framework, the Web is modeled as a graph with links between web pages represented by which of the below

- a. Cliques
- b. Vertices
- c. Sub-Graphs
- d. Edges

Question 6 — 10 points — Save Answer

A modification to the PageRank framework allows for a 'random web surfer' to 'teleport' from a given web page to any other page within the Web, with a probability level of which of the below

- a. Equal Probability
- b. High Probability
- c. Low Probability
- d. Zero Probability

Question 7 — 10 points — Save Answer

The initialization of the PageRank algorithm creates an initial vector $\mathbf{v_0}$ which has 1/n entries representing a 'random web surfer' starting at any page on the Web and transitioning to an arbitrary other page with probability distribution type of which of the below

- a. Binomial
- b. Uniform
- c. Gaussian
- d. Gamma

Question 8 — 10 points — Save Answer

A 'random web surfer' is modeled as a process within the PageRank framework as a specific type of 'memoryless' stochastic (probabilistic) process named which of the below

- a. Gaussian
- b. Martingale
- c. Markov
- d. Poisson

Question 9 — 10 points — Save Answer

The PageRank algorithm assumes the graph structure of the Web is both strongly connected and containing no dead endsy - allowed for the Transition Matrix to be 'column stochastic', which requires which of the below

- a. Diagonal values sum to 1
- b. Row values sum to 1
- c. Off-Diagonal values sum to 1
- d. Column values sum to 1

Question 10 — 10 points — Save Answer

The sum of the vector **v** representing the probability distribution of the location of a 'random web surfer' is equal to which of the below

- a. 1/n
- b. n^2
- c. 1
- d. 1/sqrt(n)