Link analysis with PageRank

1. Given is the following graph:

   ![Graph Diagram]

1a. Order the nodes in the graph based on the estimated PageRank values (You do not have to compute PageRank now!). Justify your answer.

1b. Create the link matrix $A'$ with teleportation for this graph. Use the teleportation probability of 25%.
1c. Given the PageRank formula:

\[ \tilde{x}^{k+1} = (1 - c)\tilde{x}^k A + \frac{c}{N} \tilde{e} \]

\( \tilde{e} \) is \( \tilde{1} \). In \( \tilde{x}_0 \), the random walk is uniformly distributed. Compute the vector \( \tilde{x} \) for the first five iterations of the PageRank formula (\( k = 0..4 \)) for this graph. Round to 5 decimal places!

**Crawling**

Sketch the architecture of a Crawler. How will this architecture modified in a distributed system?