1. Short answers (1 Point!):

  a). Please explain similarities and differences between PageRank and HITS?

2. Problem Solving, text classification. (4 Points!).

   1. PageRank (2 Points!)
     Suppose you have four web pages (A, B, C, and D) and the following hyperlink structure:

     Page A points to page B.
     Page B points to page C.
     Page C points to pages A and B.

     a) Draw the web graph corresponding to these four pages. (.5 Point!)

     b) Show the transition probability matrix you'll need for the PageRank computation using the random surfer approach, consider teleporting with the parameter value 10% as explained in slide 23. (1.5 Points!)

2. Hubs and Authorities (2 Points!)
   Suppose you have four web pages (A, B, C, and D) and the following hyperlink structure:

   Page A points to pages B and C.
   Page B points to pages C and D.
   Page D points to pages B and C.

   a) Draw the web graph corresponding to these four pages. (.5 Point!)

   b) Write down the initial hub and authority scores for each page. (.5 Point!)

   c) Now, run the Hubs & Authority algorithm for two iterations. You do not need to normalize your scores. Do not interleave your calculation; consider each update as an atomic step. (1 Point!)