EXERCISE 1

- Write a Matlab function `[w]=pagerank(H,γ,maxit)` that implements the pagerank (final version in the slides) algorithm, based on the power method, to approximate the dominant left-eigenvector `w` that represents the importance of the nodes (webpages). In order to make it efficient, keep in mind that :
  - H is a sparse matrix
  - the matrix $A = \gamma \cdot \hat{D}^{-1} * \hat{H} + (1-\gamma) \cdot \mathbf{1} * \mathbf{v}^T$ does not need to be computed as a matrix, neither $\hat{H}$, only the vector*matrix product $y^T * A$ needs to be computed in the power method algorithm
- Use the adjacency matrix in `pagerank.zip` or on `https://snap.stanford.edu/data/#web` in order to test the previous algorithm
- Implement a stopping criterion and test it
- For different γ the vector `w` is in general different. Analyse how the parameter γ affects the ranking. (Hint: `[importance,page]=sort(w,'descend')` returns the vector page such that `page(1)` is the ranked first page, `page(2)` is the ranked second page, `page(3)` is the ranked third page, ...)