ASSIGNMENT 3

IS 605 FUNDAMENTALS OF COMPUTATIONAL MATHEMATICS - 2014

1. Problem set 1

(1) What is the rank of the matrix A?

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ -1 & 0 & 1 & 3 \\ 0 & 1 & -2 & 1 \\ 5 & 4 & -2 & -3 \end{bmatrix} \tag{1}$$

(2) Given an mxn matrix where $m > n$, what can be the maximum rank? The minimum rank, assuming that the matrix is non-zero?

(3) What is the rank of matrix B?

$$B = \begin{bmatrix} 1 & 2 & 1 \\ 3 & 6 & 3 \\ 2 & 4 & 2 \end{bmatrix} \tag{2}$$

2. Problem set 2

Compute the eigenvalues and eigenvectors of the matrix A. You'll need to show your work. You'll need to write out the characteristic polynomial and show your solution.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{bmatrix} \tag{3}$$

Please show your work using an R-markdown document. Please name your assignment submission with your first initial and last name.