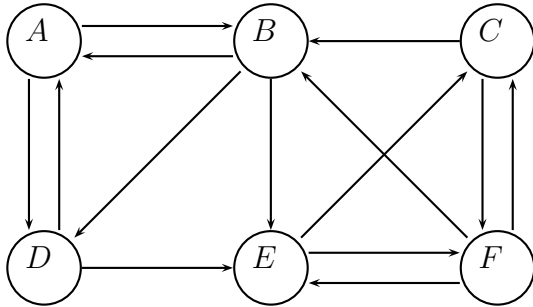


1. Say you have a network with six websites A, B, C, D, E, F which link to each other as follows:



- (a) Construct the ranking matrix for the system.
(b) Find the weight vector and rank the websites accordingly.

(over)

2. Let A be the matrix below.

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

- (a) What are the eigenvalues of A ?
- (b) If A is diagonalizable, find a matrix P and a diagonal matrix D so that $A = PDP^{-1}$. (Use your calculator for row reduction, but otherwise show all your work.)

3. (a) Write down the matrix for the linear transformation $T : \mathbb{R}^4 \rightarrow \mathbb{R}^4$ which rotates a point in $\mathbb{R}^3$ (in homogeneous coordinates) 120° degrees about the y axis, then projects onto the xy plane from the perspective of a viewer at the point $(0, 0, 10)$.

- (b) What are the apparent (x^*, y^*) coordinates of the point $(2, 1, 3)$ under this transformation?