

MSBD5002: Data Mining and Knowledge Discovery (MicroMasters)
Exercise 9 (Suggested Solution)
Web Databases

Q1 HITS Algorithm

Q1 (a)

Adjacency matrix M

$$\begin{array}{c} x \quad y \quad z \\ x \quad \begin{pmatrix} 0 & 1 & 1 \end{pmatrix} \\ y \quad \begin{pmatrix} 1 & 0 & 0 \end{pmatrix} \\ z \quad \begin{pmatrix} 1 & 1 & 0 \end{pmatrix} \end{array}$$

(b) (i)

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1.070 \\ 1.335 \\ 0.594 \end{pmatrix}$$

(ii)

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1.070 \\ 0.594 \\ 1.335 \end{pmatrix}$$

Q2 (a)

Stochastic matrix M

$$\begin{array}{c} x \quad y \quad z \\ x \quad \begin{pmatrix} 0 & 1 & 0.5 \end{pmatrix} \\ y \quad \begin{pmatrix} 0.5 & 0 & 0.5 \end{pmatrix} \\ z \quad \begin{pmatrix} 0.5 & 0 & 0 \end{pmatrix} \end{array}$$

(b)

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1.334 \\ 1 \\ 0.666 \end{pmatrix}$$