

Task: write a package or a function that can compute Adjacency matrix and Q

Input: Power Level

Output: D(Adjacency matrix) and Q

Example1:

Input:1

Output:

D: a 4X4 adjacency matrix  $\begin{bmatrix} 0,1,1,0 \\ 1,0,0,1 \\ 1,0,0,1 \\ 0,1,1,0 \end{bmatrix}$

$$Q: \begin{bmatrix} q_1 D^T D, & 0, & 0, & 0 \\ 0, & q_2 D^T D, & 0, & 0 \\ 0, & 0, & q_3 D^T D, & 0 \\ 0, & 0, & 0, & q_4 D^T D \end{bmatrix}$$

Example 2:

Input:2

Output:

D:a 16X16 adjacency matrix(I will just list the values for the first row and first

column)

$$\begin{bmatrix} 0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0 \\ 1, \\ 0, \\ 0, & . \\ 1, & & . \\ 0, & & & . \\ 0, & & & & . \\ 0, & & & & & . \\ 0, & & & & & & . \\ 0, & & & & & & & . \\ 0, & & & & & & & & . \\ 0, & & & & & & & & & . \\ 0, & & & & & & & & & & . \\ 0, & & & & & & & & & & & . \\ 0, & & & & & & & & & & & & . \\ 0, \end{bmatrix}$$

$$Q: \begin{bmatrix} q_1 D^T D & & & \\ & q_2 D^T D & & \\ & & . & \\ & & & . \\ & & & & . \\ & & & & & q_{16} D^T D \end{bmatrix}$$