How to perform an iterate of the power method (without matrices)?

$$M_m \cdot x_k = \begin{pmatrix} M_{11} & \cdots & M_{1n} \\ \vdots & & \vdots \\ M_{n1} & \cdots & M_{nn} \end{pmatrix} \begin{pmatrix} x_k^{(1)} \\ \vdots \\ x_k^{(n)} \end{pmatrix} =$$

$c_j$

$$= \begin{pmatrix} M_{11} x_k^{(1)} + \dots + M_{1j} x_k^{(j)} + \dots + M_{1n} x_k^{(n)} \\ \vdots \\ M_{n1} x_k^{(1)} + \dots + M_{nj} x_k^{(j)} + \dots + M_{nn} x_k^{(n)} \end{pmatrix} =$$

<u>Obs</u> if $c_j = 0 \Rightarrow M_{ij} = 1/n \quad \forall i$

$$= \begin{pmatrix} \sum\limits_{j \mid c_j \neq 0} M_{1j} x_k^{(j)} + \frac{1}{n} \sum\limits_{j \mid c_j = 0} x_k^{(j)} \\ \vdots \\ \sum\limits_{j \mid c_j \neq 0} M_{nj} x_k^{(j)} + \frac{1}{n} \sum\limits_{j \mid c_j = 0} x_k^{(j)} \end{pmatrix} =$$

Consider $j$ t.q. $c_j \neq 0 \Rightarrow M_{ij} = \begin{cases} 0 & \text{if } g_{ij} = 0 \\ (1-m) \cdot \frac{1}{c_j} & \text{if } g_{ij} = 1 \end{cases}$

$g_{ij} = 0 \Leftrightarrow \nexists$ link $\boxed{i} \to \boxed{j} \Leftrightarrow$

$\Leftrightarrow i \notin L_j$

Implementation of one iterate of the power method:

```
xc = x
x = 0
for j in range(0, n):
    if (c[j] == 0):
        x = x + xc[j]/n
    else:
        x[L[j]] = x[L[j]] + xc[j]/c[j]

x = (1-m)·x + m/n
```