Assignment 5 - Question 4

Consider the network comprising nodes A, B, C, and D, and represented by the matrix $M = \begin{bmatrix} 0 & 0 & 0 & \frac{1}{2} \\ 1 & 0 & \frac{1}{2} & \frac{1}{2} \\ 0 & \frac{1}{2} & 0 & 0 \\ 0 & \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$.

4(a)

Enter M as an `array`.

In [ ]:
```
import numpy as np
M = np.array([
    [0, 0, 0, 0.5],
    [1, 0, 0.5, 0.5],
    [0, 0.5, 0, 0],
    [0, 0.5, 0.5, 0]
])
```

4(b)

Let $\boldsymbol{x} = \begin{bmatrix} x_A \\ x_B \\ x_C \\ x_D \end{bmatrix}$. Use the PageRank algorithm to solve $M\boldsymbol{x} = \boldsymbol{x}$.

Hint: You may find Computer Exercise 5 helpful.

In [ ]:
```
results = np.linalg.eig(M)
eigenvector = results[1][:,0].real
eigenvector
```

Out[ ]:
```
array([0.26832816, 0.71554175, 0.35777088, 0.53665631])
```

4(c)

Hence, order the nodes A, B, C, and D from most important to least important.

In [ ]:
```
print('B,D,C,A')
```

```
B,D,C,A
```