***3.2*** The H is a matrix which is shown below:

0 1 0 0

0 0 1 0

0 0 0 1

1 0 0 0

For , with ,

Note that .

Solving with , we have = []

***3.3*** The H matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1/3 | 0 | 1/3 | 0 | 1/3 |
| 0 | 0 | 1/2 | 0 | 1/2 |
| 0 | 0 | 0 | 0 | 0 |

The matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1/3 | 0 | 1/3 | 0 | 1/3 |
| 0 | 0 | 1/2 | 0 | 1/2 |
| 1/5 | 1/5 | 1/5 | 1/5 | 1/5 |

Using the excel file attached to compute the until does not change after one iteration. The result is calculated based on the G matrixes for different , which were shown below

For ,The G matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.18 | 0.28 | 0.18 | 0.18 | 0.18 |
| 0.28 | 0.18 | 0.18 | 0.18 | 0.18 |
| 0.213333 | 0.18 | 0.213333 | 0.18 | 0.213333 |
| 0.18 | 0.18 | 0.23 | 0.18 | 0.23 |
| 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

For ,The G matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.14 | 0.44 | 0.14 | 0.14 | 0.14 |
| 0.44 | 0.14 | 0.14 | 0.14 | 0.14 |
| 0.24 | 0.14 | 0.24 | 0.14 | 0.24 |
| 0.14 | 0.14 | 0.29 | 0.14 | 0.29 |
| 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

For ,The G matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.1 | 0.6 | 0.1 | 0.1 | 0.1 |
| 0.6 | 0.1 | 0.1 | 0.1 | 0.1 |
| 0.266667 | 0.1 | 0.266667 | 0.1 | 0.266667 |
| 0.1 | 0.1 | 0.35 | 0.1 | 0.35 |
| 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

For ,The G matrix is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.03 | 0.88 | 0.03 | 0.03 | 0.03 |
| 0.88 | 0.03 | 0.03 | 0.03 | 0.03 |
| 0.313333 | 0.03 | 0.313333 | 0.03 | 0.313333 |
| 0.03 | 0.03 | 0.455 | 0.03 | 0.455 |
| 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

From the result, I observed that with different the will be different. Besides, the larger the is, the less different between G matrix and . Also note that and will always be the same no matter how the changes, because the 3rd column and the 5th of the G matrix are always the same.