Problem 3:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Doc\_001** | **Doc\_002** | **Doc\_003** | **Doc\_004** | **Doc\_005** | **Doc\_006** | **Doc\_007** | **Doc\_008** | **Doc\_009** | **Doc\_010** | **Doc\_011** | **Doc\_012** | **Doc\_013** |
| **Doc\_001** |  | 0.25 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Doc\_002** | 0.33 |  | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Doc\_003** | 0.33 | 0.25 |  | 1.00 | N/A | N/A | N/A | N/A | N/A | N/A | 0.20 | N/A | N/A |
| **Doc\_004** | 0.33 | N/A | N/A |  | N/A | N/A | 0.50 | N/A | N/A | 1.00 | 0.20 | N/A | 0.50 |
| **Doc\_005** | N/A | N/A | N/A | N/A |  | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Doc\_006** | N/A | N/A | N/A | N/A | N/A |  | 0.50 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Doc\_007** | N/A | N/A | N/A | N/A | N/A | N/A |  | N/A | N/A | N/A | N/A | N/A | N/A |
| **Doc\_008** | N/A | N/A | N/A | N/A | N/A | N/A | N/A |  | 1.00 | N/A | N/A | N/A | N/A |
| **Doc\_009** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |  | N/A | N/A | 1.00 | N/A |
| **Doc\_010** | N/A | 0.25 | 0.50 | N/A | N/A | N/A | N/A | N/A | N/A |  | 0.20 | N/A | N/A |
| **Doc\_011** | N/A | 0.25 | 0.50 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |  | N/A | 0.50 |
| **Doc\_012** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.00 | N/A | N/A | 0.20 |  | N/A |
| **Doc\_013** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.20 | N/A |  |

Problem 5:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **auth(p)** | **hub(p)** | **auth(p)** | **hub(p)** | **auth(p)** | **hub(p)** | **auth(p)** | **hub(p)** | **auth(p)** | **hub(p)** |
|  | k=0 |  | k=1 |  | k=2 |  | k=3 |  | Normalized |  |
| **Doc\_001** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.01 | 0.01 |
| **Doc\_002** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.01 | 0.01 |
| **Doc\_003** | 1 | 1 | 4 | 4 | 10 | 10 | 16 | 16 | 0.19 | 0.19 |
| **Doc\_004** | 1 | 1 | 5 | 5 | 8 | 8 | 18 | 18 | 0.21 | 0.21 |
| **Doc\_005** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| **Doc\_006** | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| **Doc\_007** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| **Doc\_008** | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0.02 | 0.02 |
| **Doc\_009** | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 0.05 | 0.05 |
| **Doc\_010** | 1 | 1 | 3 | 3 | 8 | 8 | 17 | 17 | 0.20 | 0.20 |
| **Doc\_011** | 1 | 1 | 3 | 3 | 6 | 6 | 14 | 14 | 0.16 | 0.16 |
| **Doc\_012** | 1 | 1 | 2 | 2 | 4 | 4 | 7 | 7 | 0.08 | 0.08 |
| **Doc\_013** | 1 | 1 | 1 | 1 | 3 | 3 | 6 | 6 | 0.07 | 0.07 |

Ranked, the list of documents are:

Doc\_004, Doc\_010, Doc\_003, Doc\_011, Doc\_012, Doc\_013, Doc\_009, Doc\_008, Doc\_001, Doc\_002, Doc\_005, Doc\_006, Doc\_007

Problem 6:

PageRank for each page with 3 Iterations:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Doc\_001** | **Doc\_002** | **Doc\_003** | **Doc\_004** | **Doc\_005** | **Doc\_006** | **Doc\_007** | **Doc\_008** | **Doc\_009** | **Doc\_010** | **Doc\_011** | **Doc\_012** | **Doc\_013** |
| **Start** | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 | 0.0769 |
| **1** | 0.0192 | 0.0256 | 0.1372 | 0.1564 | 0.0769 | 0.1154 | 0.0000 | 0.0769 | 0.0769 | 0.0731 | 0.0962 | 0.0923 | 0.0154 |
| **2** | 0.0064 | 0.0064 | 0.1885 | 0.1064 | 0.0769 | 0.1154 | 0.0000 | 0.0769 | 0.0923 | 0.0942 | 0.0827 | 0.0962 | 0.0192 |
| **3** | 0.0016 | 0.0021 | 0.1267 | 0.1225 | 0.0769 | 0.1154 | 0.0000 | 0.0923 | 0.0962 | 0.1124 | 0.1054 | 0.0935 | 0.0165 |