

Execution time:

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root@MACHENI-U0VI165:/mnt/c/Users/Marin/Desktop/Assignment3# python3 pagerank.py
input beta:0.85
input iterator time:40
Top ten nodes: [597621, 41909, 163075, 537039, 384666, 504140, 486980, 605856, 32163, 558791]
time cost 14.993990659713745 second
root@MACHENI-U0VI165:/mnt/c/Users/Marin/Desktop/Assignment3# python3 pagerank.py
input beta:0.85
input iterator time:60
Top ten nodes: [597621, 41909, 163075, 537039, 384666, 504140, 486980, 605856, 32163, 558791]
time cost 15.994519710540771 second
```

The above picture shows the execution time of my programming when beta = 0.85 and iterator times = 40 and 60. They took 15 seconds and 16 seconds respectively. At iteration number 60, the running time is slightly higher than at iteration number 40 but is acceptable. For PageRank algorithms, it is $O(n)$. (n depends on how many line the file contains). Because I only traversed the Web_Google.txt file once. And set the value to the sparse matrix. Sparse matrix only considers the non-zeros elements, that means it does not need to be take long times to run. In addition, The iterator time is users defined. For this party, I do not think they have a big-time consuming change.