Q1 Information and Honor Code
0 Points

In this assignment, you will work on the Colab 5 notebook and obtain results from it. If your answers are float values, round the decimal number to the **nearest 0.001**. For example, 0.2435 would become `0.244`.

You can submit as many times as you want, and the last submission will be graded. Only the fully correct answer will receive 1 point. No late day is allowed for any Colab assignment.

Please verify that you have read the above instructions and the Stanford Honor Code and that you have not given or received unpermitted aid while completing this assignment.

If you have any questions about how the Honor Code applies to Colab assignments or other parts of the course, please contact the teaching staff for clarification.

⊙ I have read and understood the above information

Q2 Weakly connected component
2 Points

Using NetworkX, you analyze the web-Stanford graph, and obtain the largest weakly connected component(WCC).

Q2.1
1 Point

How many nodes are present in the largest WCC? (Integer)

Q2.2
1 Point

What is the average out-degree of the largest WCC? (Float)

Q3 Graph generation
4 Points

Next, you approximate the web-Stanford graph with either a random graph, or a Barabasi-Albert graph as instructed in the notebook.

Q3.1 Edges in random graph
1 Point

How many edges are present in the generated random graph? (Integer)

Q3.2 Node id with maximal PR
1 Point

You then calculate the PageRank (PR) values for the random graph. Which node has the largest PageRank value? (Integer)

Q3.3 Edges in Barabási-Albert graph
1 Point

How many edges are present in the generated Barabási-Albert graph? (Integer)

Q3.4 Max value of PR
1 Point

You then calculate the PageRank (PR) values for the Barabási-Albert graph. What is range of the largest PageRank value?

- ○ $(10^{-6}, 10^{-5})$
- ○ $(10^{-5}, 10^{-4})$
- ○ $(10^{-4}, 10^{-3})$
- ○ $(10^{-3}, 10^{-2})$
- ○ $(10^{-2}, 10^{-1})$

Q4 Cosine similarity

2 Points

Finally, you calculate the cosine similarity between the sorted PageRank-value vectors.

Q4.1

1 Point

What is the cosine similarity between the web-Stanford graph and the random generated graph?
(Float)

Q4.2

1 Point

What is the cosine similarity between the web-Stanford graph and the Barabási-Albert graph?
(Float)