Strong Components
Kosaraju's Algorithm

Due January 25, 2019

Given a digraph G, implement Kosaraju's Algorithm to find G's strong components. Then, output the **component graph** of G, i.e., the DAG whose vertices are in a 1-1 correspondence with the strong components of G. The input and output will be from stdin and to stdou, respectively,t and will be formatted as follows:

Input Format:

n e
i_0 j_0
…
i_e-1 j_e-1

Here, n, the number of vertices ≤ 10000 and e, the number of arcs ≤ 100000. i_k and j_k are the indices, starting from 0, that define the arcs of the digraph.

Output Format:

nsc
n_0 i_00 i_01 … i_0,n_0
…
n_nsc-1 i_k0 … i_k,n_nsc-1 (where k = nsc-1)
ne
p_0 q_0
…
p_ne-1 q_ne-1

Here

- n = # of vertices in G
- e = # of arcs in G
- nsc = # of strong components in G
- ne = # of arcs in the G's component DAG
- i_kj = index of vertex in the kth component of G
- p_i and q_i define an arc in G's component DAG

The ordering of the strong components and vertices within them and their connecting arcs is arbitrary.