CREATING DEGREE-PAIR-SEQUENCE

Recall that degreePair-sequence of a digraph does not depend on the node labels, which is also the case for each of outdegree-sequence and indegree-sequence.

Steps in creating the degreePair-sequence of a digraph.

(1) Find the outdegree of each node and write down the outdegree-sequence.

(2) Replace now each term d_i in the outdegree-sequence by the pair "$(d_i, \cdots)$", where the parts "$\cdots$" will be filled by indegees.

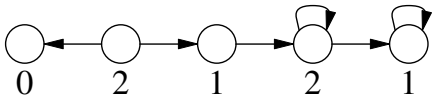
(3) For each group of nodes which have the same outdegree d_i, say, do the following:

  (a) Find the indegree of those nodes.

  (b) Fill in the part "$\cdots$" of the pairs $(d_i, \cdots)$ for that outdegree d_i by the indegrees of the nodes in the current group in the non-increasing order.

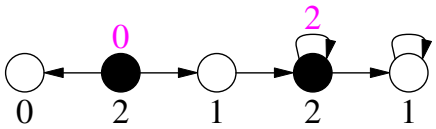
Example.

Consider the digraph below, with the outdegrees shown next to each node.



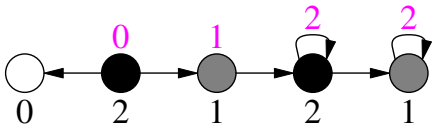
After steps (1)-(2), we get the sequence: $\langle(2, \cdots), (2, \cdots), (1, \cdots), (1, \cdots), (0, \cdots)\rangle$.

1st iteration of step (3.a) for $d_i = 2$: shown below are the nodes with outdegree 2 filled in and also shown are their indegrees in red-color.



1st iteration of step (3.b) now gives the sequence $\langle(2, 2), (2, 0), (1, \cdots), (1, \cdots), (0, \cdots)\rangle$.

2nd iteration of step (3) for $d_i = 1$ gives the sequence $\langle(2, 2), (2, 0), (1, 2), (1, 1), (0, \cdots)\rangle$. Nodes with outdegree 1 are shown below shaded lightly, and also shown are their indegrees.



3rd iteration of step (3) for $d_i = 0$ gives the sequence $\langle(2, 2), (2, 0), (1, 2), (1, 1), (0, 1)\rangle$, which is the final degreePair-sequence.