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**Algorithm 1** Creating a spanning tree on a graph with per-vertex degree constraints

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- 1: Graph  $G(V, E)$  with a total degree of  $2n-2$  where  $n$  is the magnitude of  $V$
  - 2:  $T = \emptyset$
  - 3:  $T += (v1, v2)$  where  $v1$  is the vertex of largest degree in  $V$ , and  $v2$  is the vertex of second largest degree. Decrement the degree of  $v1$  and  $v2$
  - 4: **while** There exists a vertex in  $V$  and  $T$  with a degree  $> 0$  **do**
  - 5:      $T += (t, v)$  where  $t$  is the vertex of largest degree in  $t$ , and  $v$  is the largest vertex in  $V \setminus T$
  - 6: **end while**
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