

Small Assignment 2

Tuesday, October 15, 2024 12:18 PM

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- 1) Find and draw the tree that the Prüfer encoding $\langle 3, 2, 5, 1, 7, 3, 4 \rangle$. Indicate the leaves and the order of the edges as you get them.

$$P = \langle 3, 2, 5, 1, 7, 3, 4 \rangle$$

Original tree must have $7+2 = 9$ vertices, so, our $L = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Current leaves, vertices NOT in $P \rightarrow \{6, 8, 9\}$

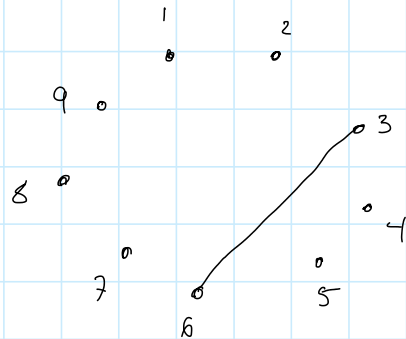
- ① Take smallest from leaf set

leaves $\rightarrow \{6, 8, 9\} \rightarrow 6$ is smallest

$3 \{2, 5, 1, 7, 3, 4\} \rightarrow$ add edge, $3-6$

6

New leaves
 $\{8, 9\}$



- ② leaf set $\{8, 9\} \rightarrow$ Take 8

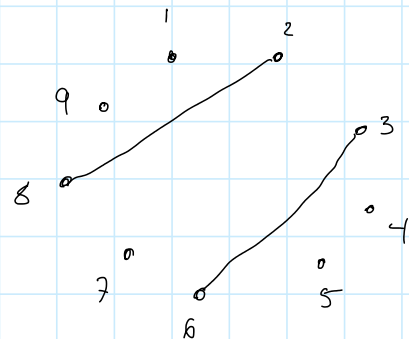
$3 \{2, 5, 1, 7, 3, 4\}$

1 1
6 8

\rightarrow add edge $2-8$

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New leaves
 $\{2, 9\}$



- ③ leaf set $\{2, 9\} \rightarrow$ use 2

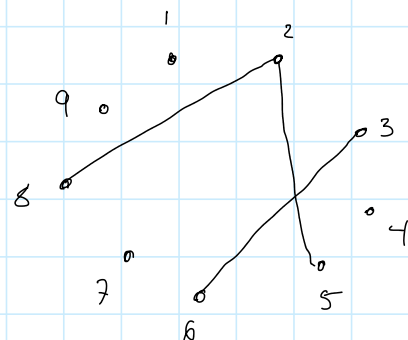
$3 \{2, 5, 1, 7, 3, 4\}$

1 1 1
6 8 2

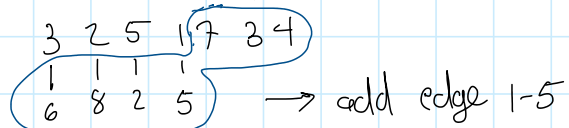
\rightarrow add $5-2$ edge

↓

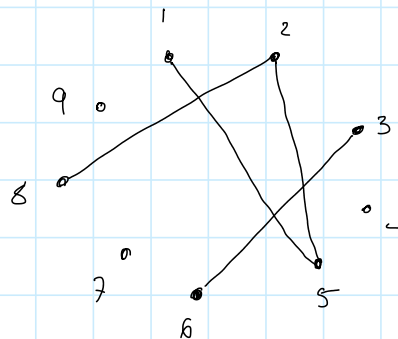
New leaves
 $\{5, 9\}$



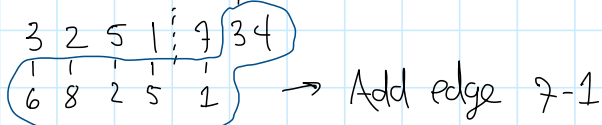
④ leaf set $\{5, 9\} \rightarrow$ use 5



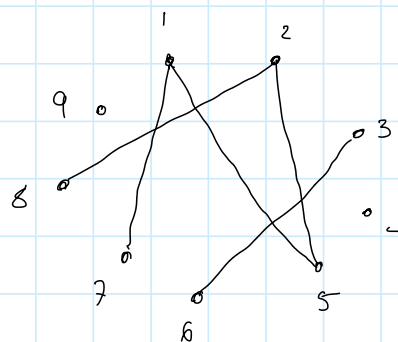
\downarrow
New leaf set
 $\{1, 9\}$



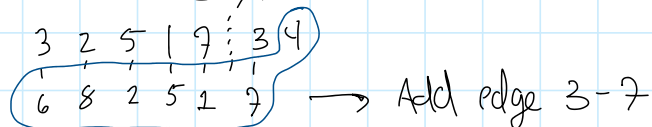
⑤ leaf set $\{1, 9\} \rightarrow$ use 1



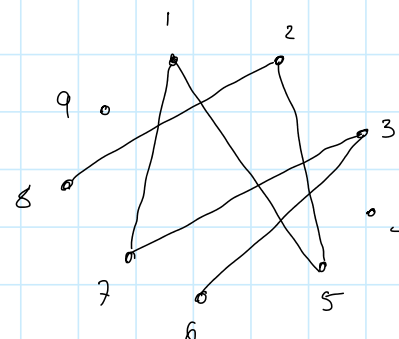
\downarrow
New leaf set
 $\{7, 9\}$



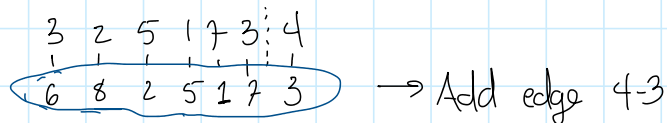
⑥ leaf set $\{7, 9\} \rightarrow$ use 7



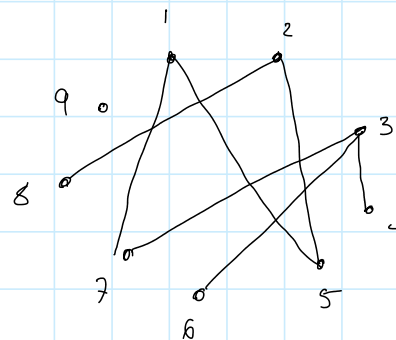
\downarrow
New leaf set
 $\{3, 9\}$



⑦ leaf set $\{3, 9\} \rightarrow$ use 3

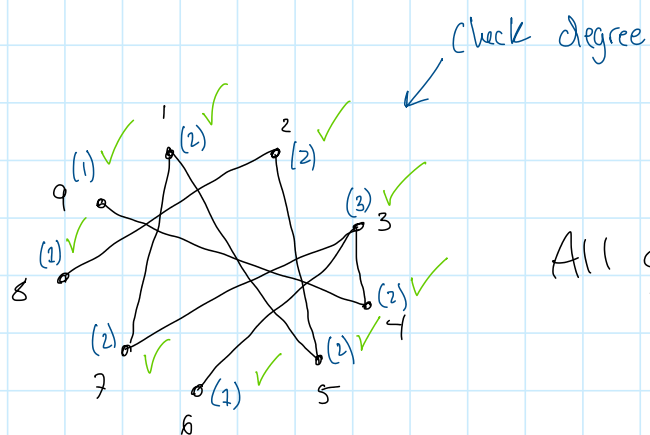
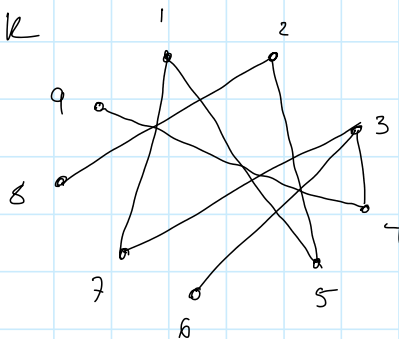


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Done with
P set, last remaining
leaves are $\{4, 9\}$



⑧ Look Step $\rightarrow \{4, 9\}$, Connect an edge, check degree. Based on P , we can get deg via its # of appearances + 1
 $P = \langle 3, 2, 5, 1, 7, 3, 4 \rangle$

Vertex	1	2	3	4	5	6	7	8	9
deg	2	2	3	2	2	1	2	1	1
#'s	1	1	2	1	1	0	1	0	0



All good!