

%% Q.8: How frequently does a graph-node appear in a path's second-to-last position and what are the number of paths ending in each FP?

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FPs = [20, 45, 54]; % All fixed points row vector

numFPs = length(FPs); % Extract number of FPs

numFPendPaths = zeros(length(FPs), 1); % Initialize vector to store number of
times each FP appears in path ends

nodeFound = zeros(size(acyclicPaths, 1), 2); % Initialize matrix to store graph-
node IDs and counts across paths

for inNodeFound = 1:size(acyclicPaths, 1) % Iterate through all graph-nodes

    nodeFound(inNodeFound, 1) = inNodeFound; % Fill up matrix column with graph-
node IDs

end

for inAcyclicPaths = 1:size(acyclicPaths, 1) % Iterate through all paths on STG

    rowAcyclicPaths = acyclicPaths{inAcyclicPaths, 1}; % Extract all paths
starting from current graph-node

    pathsInRow = length(rowAcyclicPaths); % Extract number of paths starting
from current graph-node

    for inNodePaths = 1:pathsInRow % Iterate through all paths starting from
current graph-node

        pathHere = rowAcyclicPaths{inNodePaths}; % Extract current path

        if length(pathHere) >= 2 % Path does not start with FP; FP path length
is 1

            secondToLastNode = pathHere(end - 1); % Extract graph-node in second-
to-last position in current path

            nodeFound(secondToLastNode, 2) = nodeFound(secondToLastNode, 2) + 1;
% Update current graph-node's count

        else % Path length = 1 (current graph-node is FP)

            continue % Go to next path

        end

        currentLastNode = pathHere(end); % Extract current path last node (FP)

        indexCurrentFP = find(FPs == currentLastNode); % Extract index of
current path FP
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        numFPendPaths(indexCurrentFP) = numFPendPaths(indexCurrentFP) + 1; %
Update count of current FP

    end

end

graphNode = nodeFound(:, 1); % Extract column 1 from second-to-last graph-nodes
and counts matrix

appearsPathSecondToLast = nodeFound(:, 2); % Extract column 2 from second-to-
last graph-nodes and counts matrix

pathSecondToLastTable = table(graphNode, appearsPathSecondToLast); % Create
table for second-to-last graph-nodes and their counts

secondToLastTableSorted = sortrows(pathSecondToLastTable, 2, 'descend'); % Sort
table entries in descending order of second-to-last graph-node counts

disp('Table for graph-nodes and number of times they appear second-to-last in a
path:'); % Table contents description

disp(secondToLastTableSorted); % Display sorted table

FPsColumn = FPs'; % Transpose FPs row vector to column vector for table

numFPendPathsTable = table(FPsColumn, numFPendPaths); % Create table for FPs and
number of times each one appears in path end

disp('Table for number of paths ending in each FP:'); % Describe table's contents

disp(numFPendPathsTable); % Display table

```

### Output:

Table for graph-nodes and number of times they appear second-to-last in a path:

graphNode	appearsPathSecondToLast
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61	107
52	94
38	86
22	72
37	64
53	64

48	51
46	42
28	32
60	27
36	23
29	22
47	21
21	18
24	18
40	18
56	18
62	18
13	16
23	15
39	15
55	15
27	13
3	10
5	10
35	10
19	7
59	7
4	5
6	5
1	3
7	3
9	3
10	3
11	3
12	3
15	3
16	3

17	3
25	3
26	3
31	3
32	3
33	3
41	3
42	3
43	3
44	3
49	3
51	3
57	3
58	3
64	3
2	2
8	2
14	2
18	2
30	2
34	2
50	2
63	2
20	0
45	0
54	0

Table for number of paths ending in each FP:

<b>FpsColumn</b>	<b>numFPendPaths</b>
20	308

45 322

54 378