Question 1:

1) When the minFreq is set to 3, in that five graphs, there could be such four patterns which occurrence frequency no less than 3:

Patterns	Occurred In
C	(a), (b), (c), (d), (e)
C-C	(a), (b), (c), (d), (e)
C-C-C	(a), (b), (c), (d), (e)
C-C-C-C	(a), (b), (d), (e)

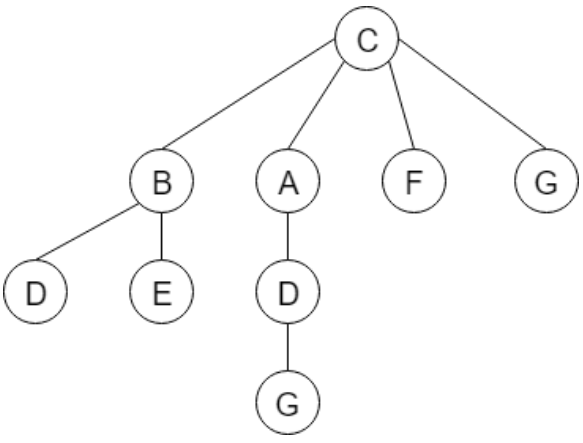
Question 2:

1) The following steps show the process to convert it to NEC Tree:
   1. Root Node Selection
      We have such equation to calculate the ranking value:

$$Rank(u) = \frac{freq(g, L(u))}{deg(u)}$$

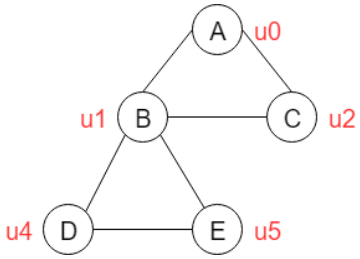
      Therefore, we have such rankings:
      $Rank(u0) = 1/3$
      $Rank(u1) = 2/4$
      $Rank(u2) = 1/4$
      $Rank(u3) = 2/2$
      $Rank(u4) = 2/2$
      $Rank(u5) = 1/2$
      $Rank(u6) = 2/1$
      $Rank(u7) = 3/1$
      $Rank(u8) = 3/1$
      Therefore, u2(C) has the smallest ranking value, which has been chosen for the root node.

   2. Rewrite query q into NEC Tree

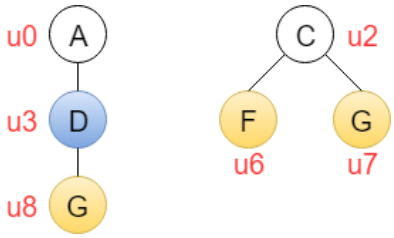


      There are no vertices from same NEC Tree, so we do not merge any vertices.

2) Following steps show how to decompose the query graph q into Core-Forest-Leaf decomposition:
Decompose to the core-set. Core-set should contain **all non-tree edges**.
Therefore, core-set is shown below:



Forest structure should contain **all other edges not in the core-set.**
Therefore, forest structure (not forest set) is shown below:



Decompose forest structure into to the forest-set and leaf-set. Leaf-sets should contain **one-degree vertices** connected to the forest-set, and forest-set should contain **all vertices not in the union set of core-set and leaf-set**.
Therefore, all sets are shown below:

Core-set: {u0, u1, u2, u4, u5}
Forest-set: {u3}
Leaf-set: {u6, u7, u8}

Question 3:

1) v3 is the vertex that can generate the largest influence spreads.
Here is my procedure of proof:

From the graph G1, we can see that all factors transferring between vertices are less than 1, which means that **the 1st transfer is the most critical**, and after that the weighted influence will become lower by the "order of magnitude". For example, when the factor of first transfer and second transfer are both 0.3, the influence of second vertex can be 0.3, but the influence of third vertex will be 0.09.

Therefore, **one vertex has the most degrees and the largest factors of 1st transfer** will be selected as activated seed to generate the largest influence spreads. **Therefore, v3 should be selected**. And simulating by a Python program, the result shown below proves my assertion:

Activated seed to be selected	$\sum_{i=0}^{9} w(v_i)$
0	1.2962
1	1.5979200000000002
2	1.7810000000000001
3	2.834
4	1.7790400000000002
5	1.39126
6	1.6041999999999998
7	1.6948
8	1.35968
9	1.8984

Then, v3 should be selected as activated seed that can generate the largest influence spreads.