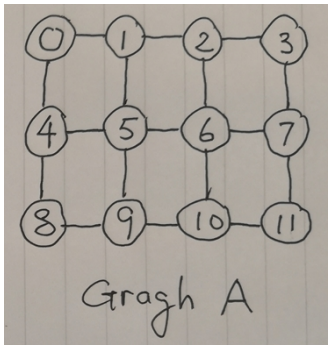
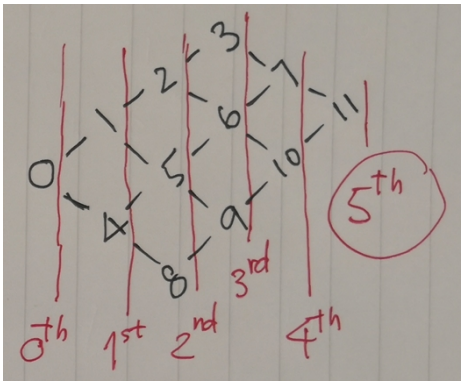
Question I Give a Graph A as shown:



1) What is the diameter of Graph A? (The diameter of a graph is defined as the **largest shortest path distance in the graph**. In other words, it is the maximum value of over all pairs, where denotes the shortest path distance from vertex to vertex.)
2) Write down a depth-first search visiting order starting from 0 to visit all vertices in Graph A.
3) Write down a breadth-first serach visiting order starting from 0 to visit all vertices in Graph A.

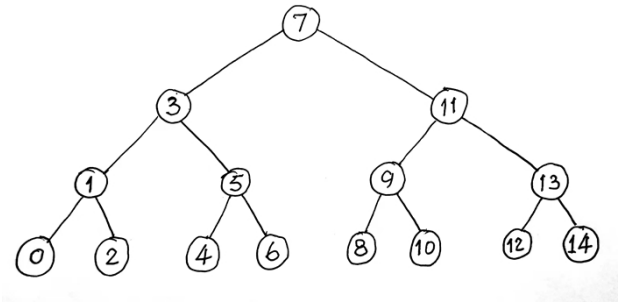
Ref. Ans. For Question I:

1) The diameter of Graph A is 5, as shown in the following figure:



2) One of the DFS visiting order (not unique): 0, 1, 2, 3, 7, 6, 5, 4, 8, 9, 10, 11.
3) One of the BFS visiting order (not unique): 0, 1, 4, 2, 5, 8, 3, 6, 9, 7, 10, 11.

Question II Give a binary tree as in Graph B.



Graph B A binary tree to be visited

4) Write down the vertex series using depth-first search by pre-order to visit all vertices in Graph B.

5) Write down the vertex series using depth-first search by in-order to visit all vertices in Graph B.

6) Write down the vertex series using breadth-first search by pre-order to visit all vertices in Graph B.

Ref. Ans. For Question II:

4) DFS by pre-order: `7, 3, 1, 0, 2, 5, 4, 6, 11, 9, 8, 10, 13, 12, 14.`

5) DFS by in-order: `0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.`

6) BFS by pre-order: `7, 3, 11, 1, 5, 9, 13, 0, 2, 4, 6, 8, 10, 12, 14.`