**2(a)** [**15 points**] Explain how one can use BFS to determine if an undirected graph contains a cycle.

If we meet a vetex which we have visited before in the while loop, that means this undirected graph contains a cycle.

**(b)** On undirected graphs, do either of the two traversals, DFS or BFS, always find a cycle faster than the other? If yes, indicate which of them is better and explain why it is the case; if not, draw two graphs supporting your answer and explain the graphs. [**15 points**]

BFS is faster than DFS, because BFS method visited all of the adjacent vertices of a same level, so it can find the smallest circle. However DFS explores as far as possible along each branch, so it needs more time to find a circle.

**(c)** Explain why a topological sort is not possible on this graph. [**10 points**]

Because topological sort must be a acyclic linear ordering of all vertices of the graph,but in this picture, there are more than 1 circle in it, so topological sort is not possible on this graph.