detect cycle

https://www.geeksforgeeks.org/detect-cycle-in-a-graph/

1. we need check the cycle starting from every vertex

2. then we need a visited flag to avoid repeat

3. when we think we find a cycle? when we meet a vertex we already visited?

   No!

   for above example, we alread visited 3 when we visit from 1.

   When we visit starting from 4, we found 3 alread visited but it's not cycle. So the critera to decide a cycle is a vertex visited twice in starting from the same vertex. So we need another flag to remember the vertex we visited in one path.