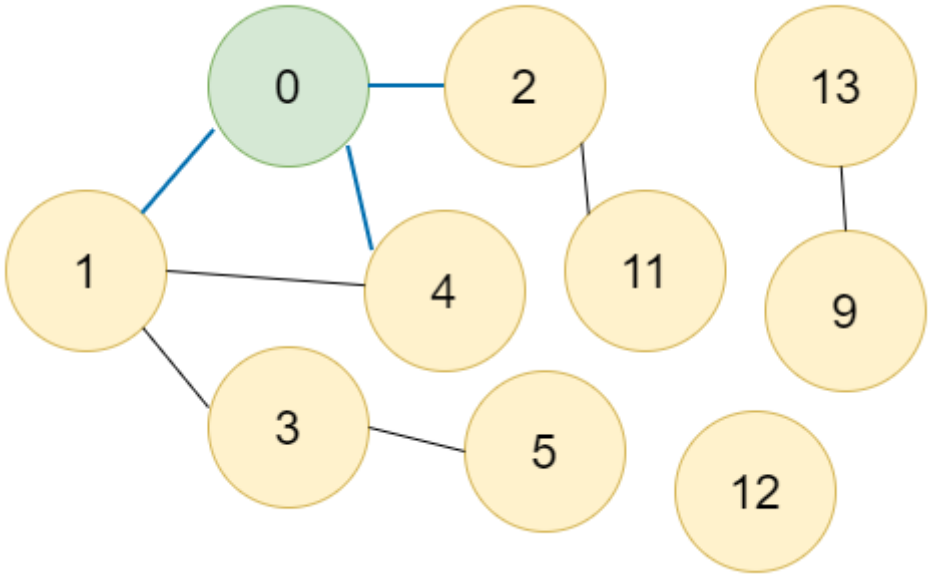
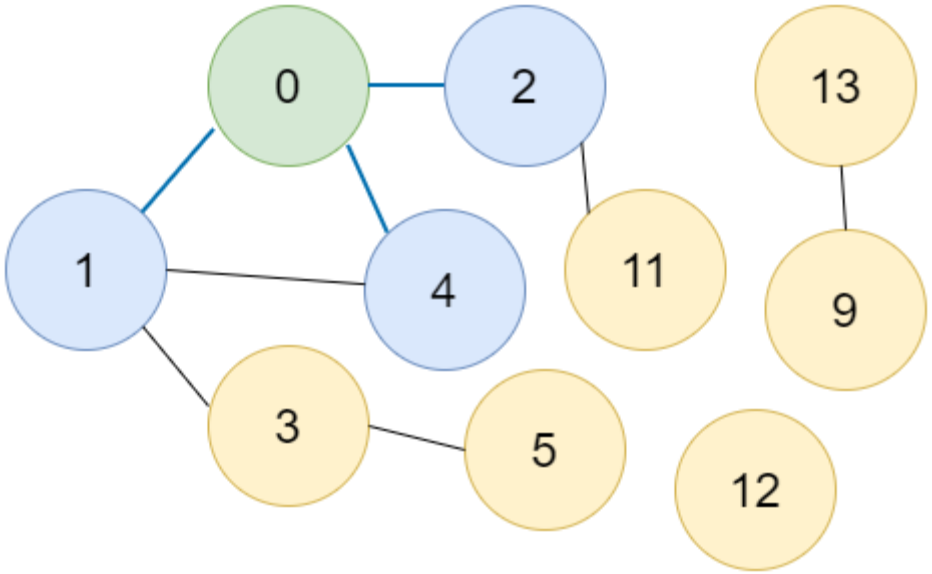
GRAPH TRAVERSAL ALGORITHM: DEPTH FIRST SEARCH (DFS) (WITH STACK)

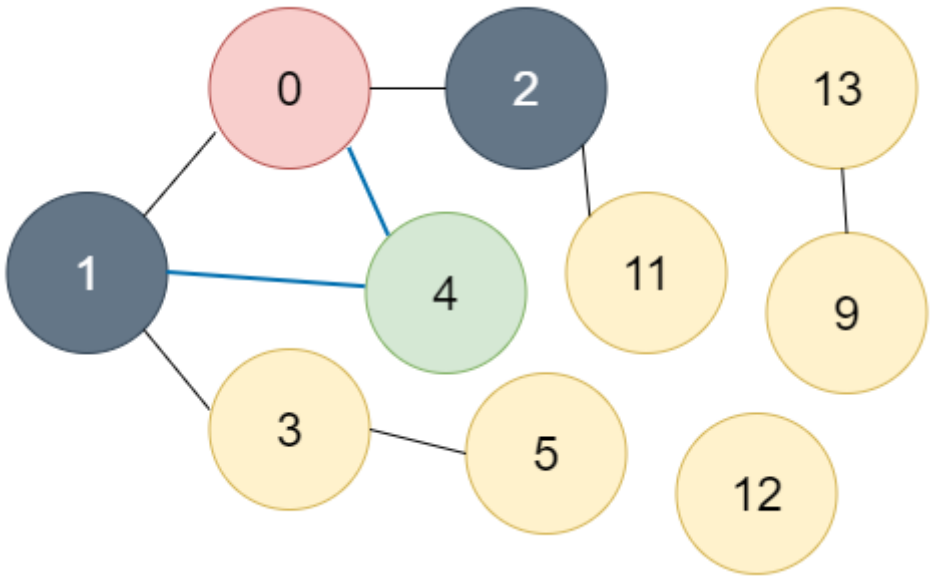


0

Stack

4
2
1
Stack





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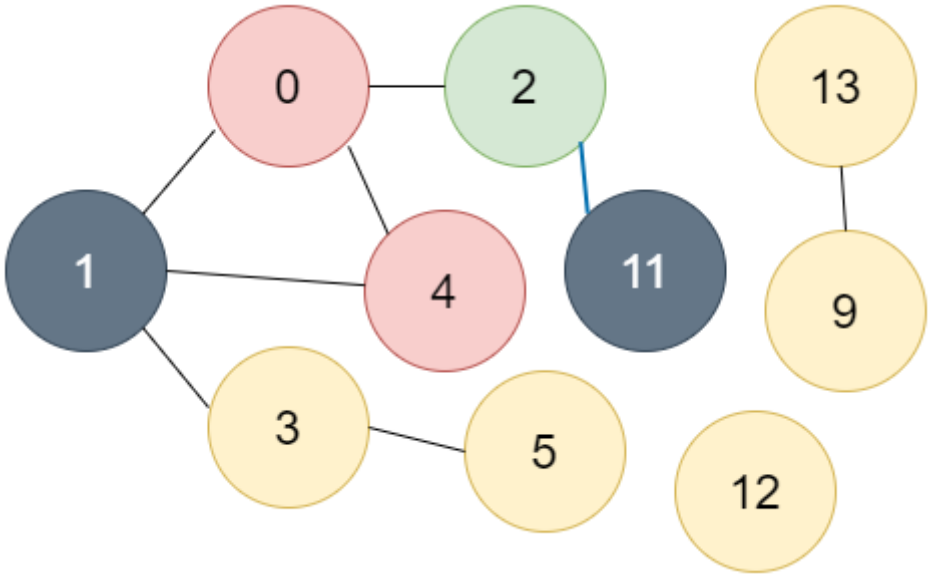

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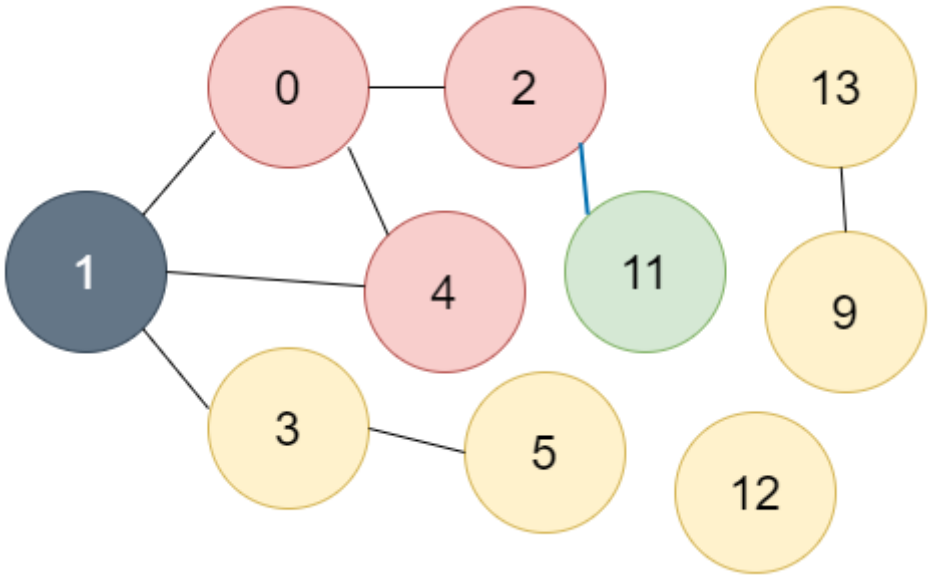

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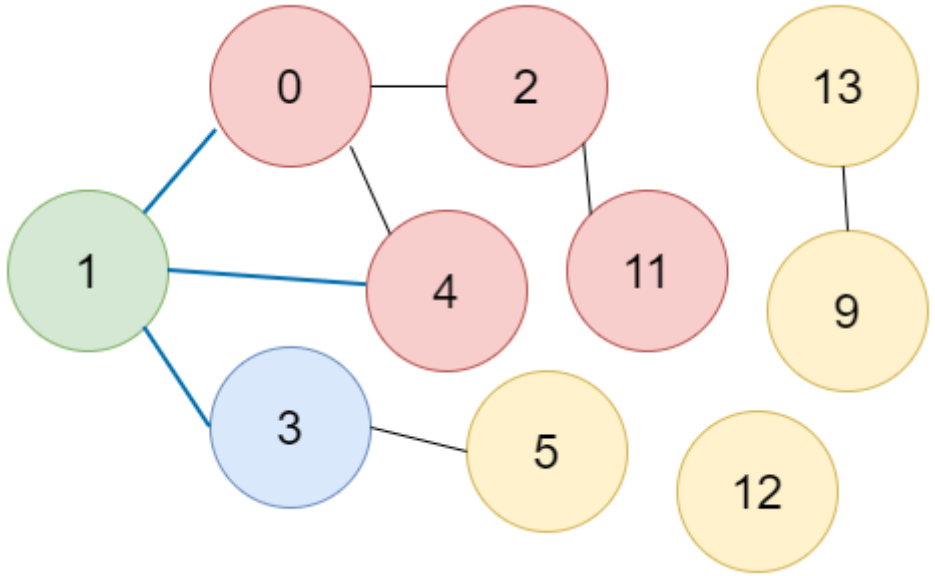

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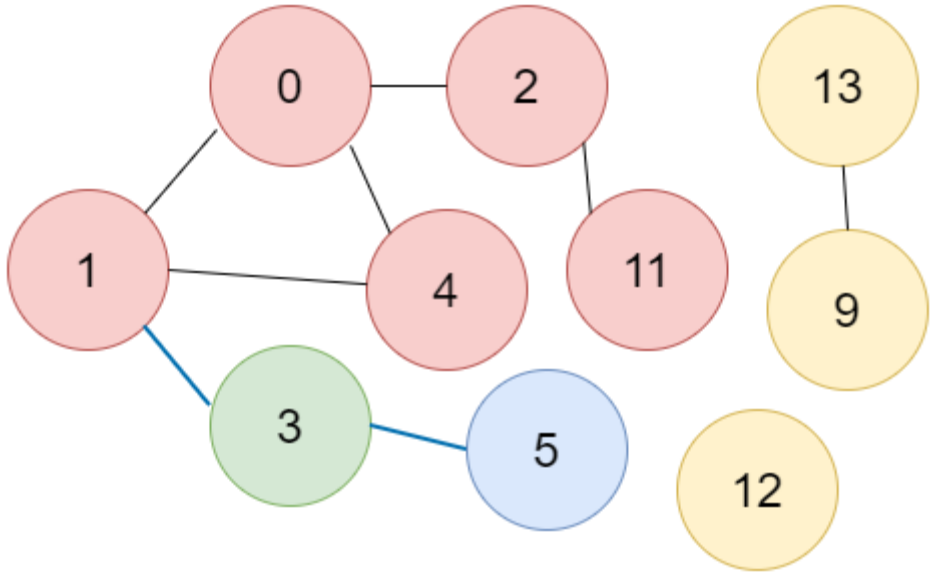

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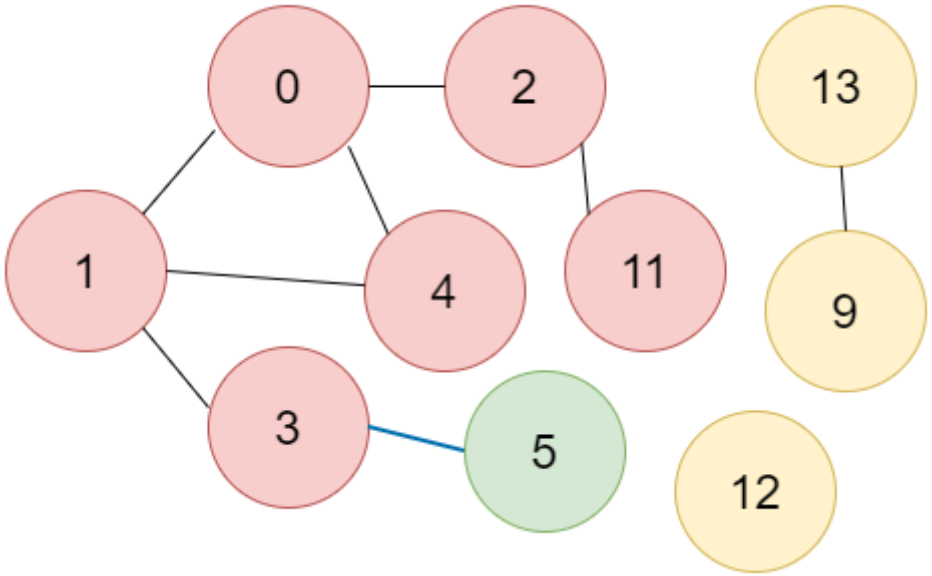

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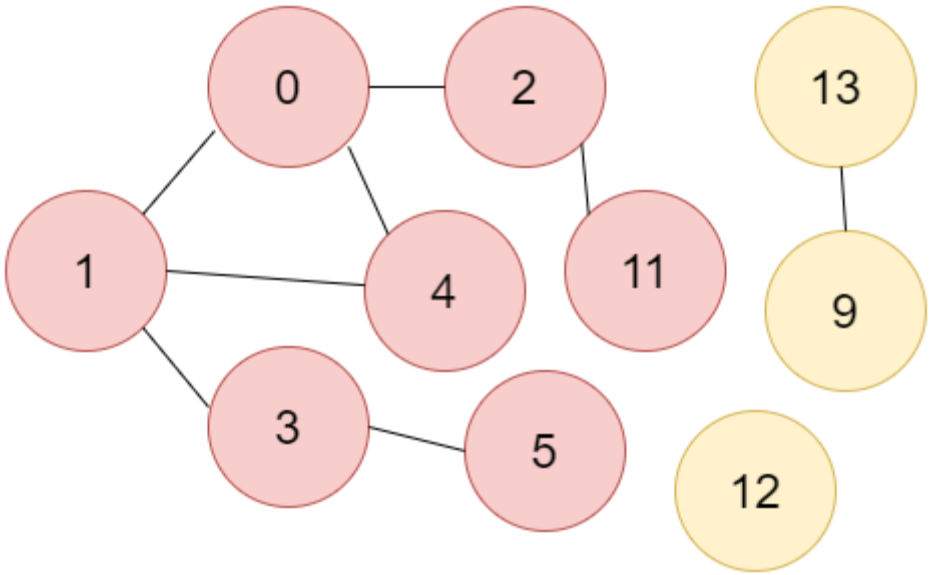

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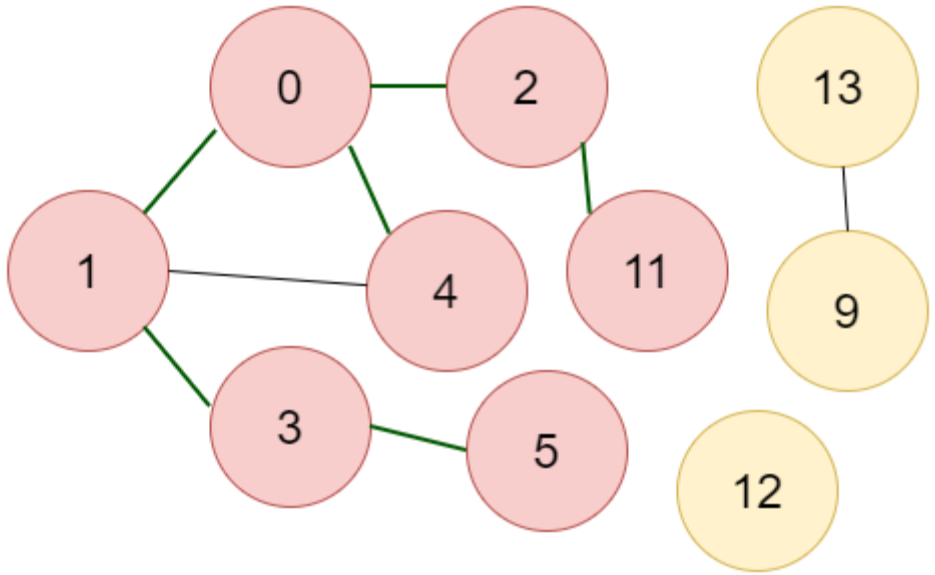

PSEUDO CODE

DFS (Iterative Version)

Input: graph $G = (V, E)$ in adjacency-list representation, and a vertex $s \in V$.
Postcondition: a vertex is reachable from s if and only if it is marked as "explored."

```
mark all vertices as unexplored
S := a stack data structure, initialized with s
while S is not empty do
    remove ("pop") the vertex v from the front of S
    if v is unexplored then
        mark v as explored
        for each edge (v, w) in v's adjacency list do
            add ("push") w to the front of S
```

Image source: T. Roughgarden

Complexity: $O\ (V + E\ )$

NEXT TOPIC?

Breadth First Search (BFS)