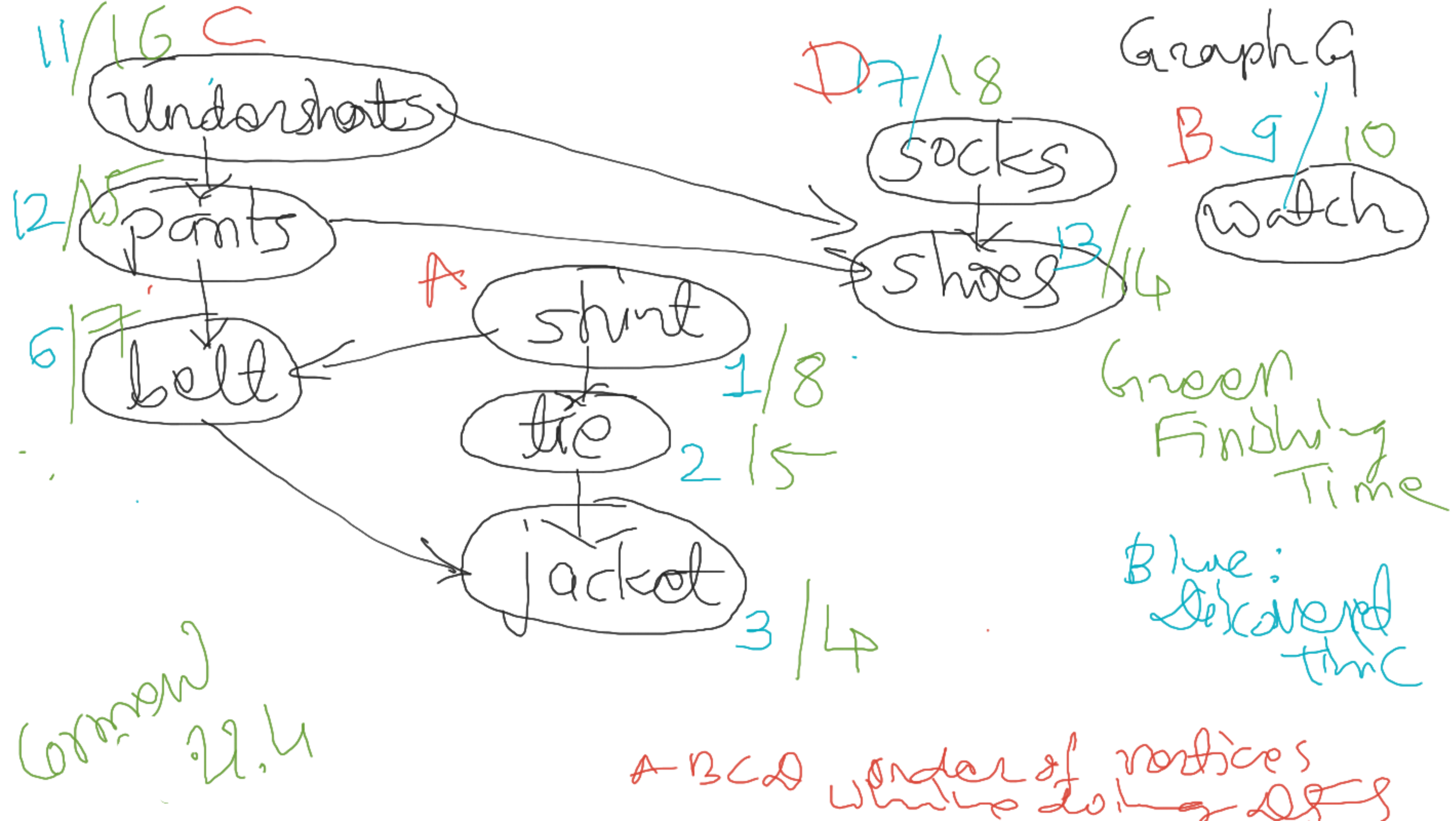


Topological sort

DAG: Directed Acyclic Graph

A DAG with no cycles

→ A topological sort of a DAG $G = (V, E)$ is a linear ordering of all its vertices such that if G contains an edge (u, v) then u appears before v in the ordering. (If the graph contains a cycle, no linear ordering is possible).



Finishing Time : When during traversal, and subgraph completed for that node, the timestamp is marked for that node.

Discovered Time : When during traversal, the node is first visited, timestamp is marked as discovered time of that node for that node.

Algorithm TopologicalSort(G) : Linked list

1) Call ~~Dfs~~ DFS(G) to compute finishing times $v.f$ for each vertex v

2) as each vertex is finished:
insert it into the front of
a linked list.

3) return the linked list of vertices

DFS Traversal

***** DFS Traversal from node shirt *****

Node Visited: shirt

Node Visited: tie

Node Visited: jacket

Node Visited: belt

DFS Traversal

***** DFS Traversal from node watch *****

Node Visited: watch

DFS Traversal

***** DFS Traversal from node undershorts *****

Node Visited: undershorts

Node Visited: pants

Node Visited: shoes

DFS Traversal

***** DFS Traversal from node socks *****

Node Visited: socks

Node Source shirt -> discovered at 1 -> finished at 8 ->
 (DestinationNode tie, Weight 0)
 (DestinationNode belt, Weight 0)
Node Source tie -> discovered at 2 -> finished at 5 ->
 (DestinationNode jacket, Weight 0)
Node Source jacket -> discovered at 3 -> finished at 4 ->
Node Source belt -> discovered at 6 -> finished at 7 ->
 (DestinationNode jacket, Weight 0)
Node Source watch -> discovered at 9 -> finished at 10 ->
Node Source undershorts -> discovered at 11 -> finished at 16 ->
 (DestinationNode pants, Weight 0)
 (DestinationNode shoes, Weight 0)
Node Source pants -> discovered at 12 -> finished at 15 ->
 (DestinationNode shoes, Weight 0)
 (DestinationNode belt, Weight 0)
Node Source shoes -> discovered at 13 -> finished at 14 ->
Node Source socks -> discovered at 17 -> finished at 18 ->
 (DestinationNode shoes, Weight 0)

***** TOPOLOGICAL SORTING LIST *****

socks undershorts pants shoes watch shirt belt tiejacket