CS208 · Algorithm Design

Assignment 3

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1 Chapter 3

1.1 Exercise 1

Six.
Node a must be first and node f must be last in the topological order. Then we have the orders as below:

$$a,b,c,d,e,f$$
$$a,b,d,c,e,f$$
$$a,b,d,e,c,f$$
$$a,d,e,b,c,f$$
$$a,d,b,c,e,f$$
$$a,d,b,e,c,f$$

1.2 Exercise 3

The algorithm is as below:

- For every vertex in graph G, there is a property $isTraversed$, which is initially $false$, to indicate whether this vertex is traversed.
- Create an empty list L
- Run DFS on G. Whenever a vertex is poped out from stack, add it into L and set its property $isTraversed$ to be $true$.
- Every time check if the vertex's neighbour $isTraversed$ is $true$ before check it is visited.
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  - If during the DFS, no vertex's neighbour $isTraversed$ is $true$, then reversely output L as topological order.
  - If once there is a vertex's neighbour $isTraversed$ is $true$, then output this neighbour and reversely output L until meet the same node as this neighbour.