ANSWER

1.

a. Network 1.a

```
[[2 1 1 1 1 0 0]
 [1 0 1 0 0 0 0]
 [1 1 1 1 0 0 1]
 [1 0 1 0 1 0 1]
 [1 0 0 1 1 1 1]
 [0 0 0 0 1 0 1]
 [0 0 1 1 1 1 0]]
```

b. Network 1.b

```
[[0 0 1 1 1 0 0]
 [0 0 0 1 1 1 1]
 [1 0 0 1 0 0 1]
 [1 1 1 0 1 0 0]
 [1 1 0 1 0 0 1]
 [0 1 0 0 0 0 1]
 [0 1 1 0 1 1 0]]
```

C. list all the paths from node 1 to node 7

i. 1 → 3 → 7

ii. 1 → 4 → 5 → 2 → 7

iii. 1 → 5 → 2 → 7

2. Is the following network in Fig. 2 an acyclic network? Please apply the algorithm in lecture 2 to check, and give thedetailed steps

a. Node 4 with no outgoing edges is removed.

b. Node 6 with no outgoing edges is removed.

c. Node 7 with no outgoing edges is removed.

d. Node 5 with no outgoing edges is removed.

e. Node 3 with no outgoing edges is removed.

f. Node 1 with no outgoing edges is removed.
g. Node 2 with no outgoing edges is removed.
h. All nodes have been removed, the network is acyclic.

3. network of authors and books where edges connect authors to books they have written. Thisnetwork is bipartite because it has two types of nodes (authors and books), and edges only exist between nodes of different types.