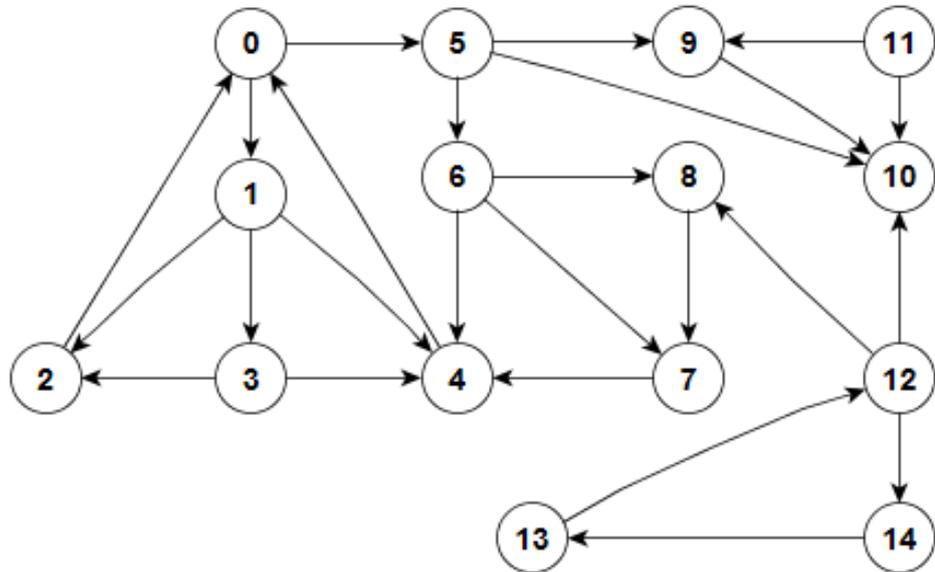


## *Basics of Graph Theory*

### Exercise 6:

Given the graph:



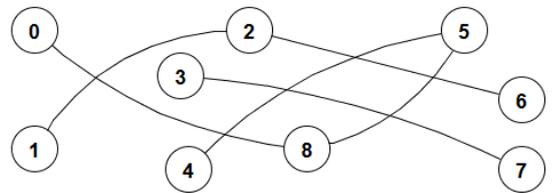
- Is the graph connected? Why? Determine all connected components. (Mathematical representation of each component).
- Is the graph strongly connected? Why? Determine all strongly connected components (Mathematical representation of each component).

### Exercise 7:

- Give the number of edges in a complete graph of order  $n$ .
- Prove that in a complete graph with  $n$  vertices, each vertex has degree  $n - 1$ .

### Exercise 8:

- Is the graph connected?
- Determine all the connected components.
- Transform this graph by adding a minimum number of edges to make it connected



### Exercise 9:

Propose an algorithm for constructing:

- The incidence matrix from the adjacency matrix of a graph,
- The adjacency matrix from the incidence matrix of a graph,