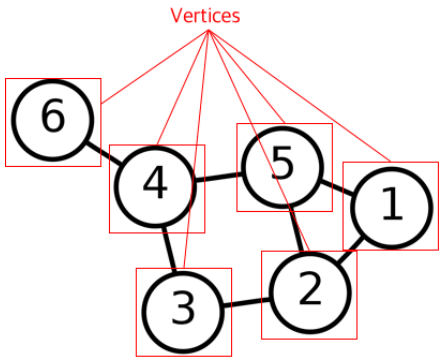
CSC373 Worksheet 4 Solution

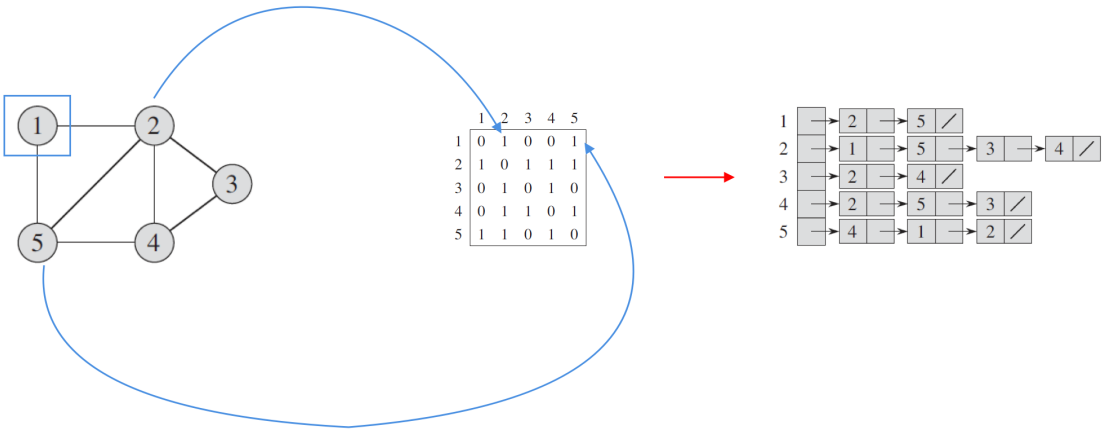
August 3, 2020

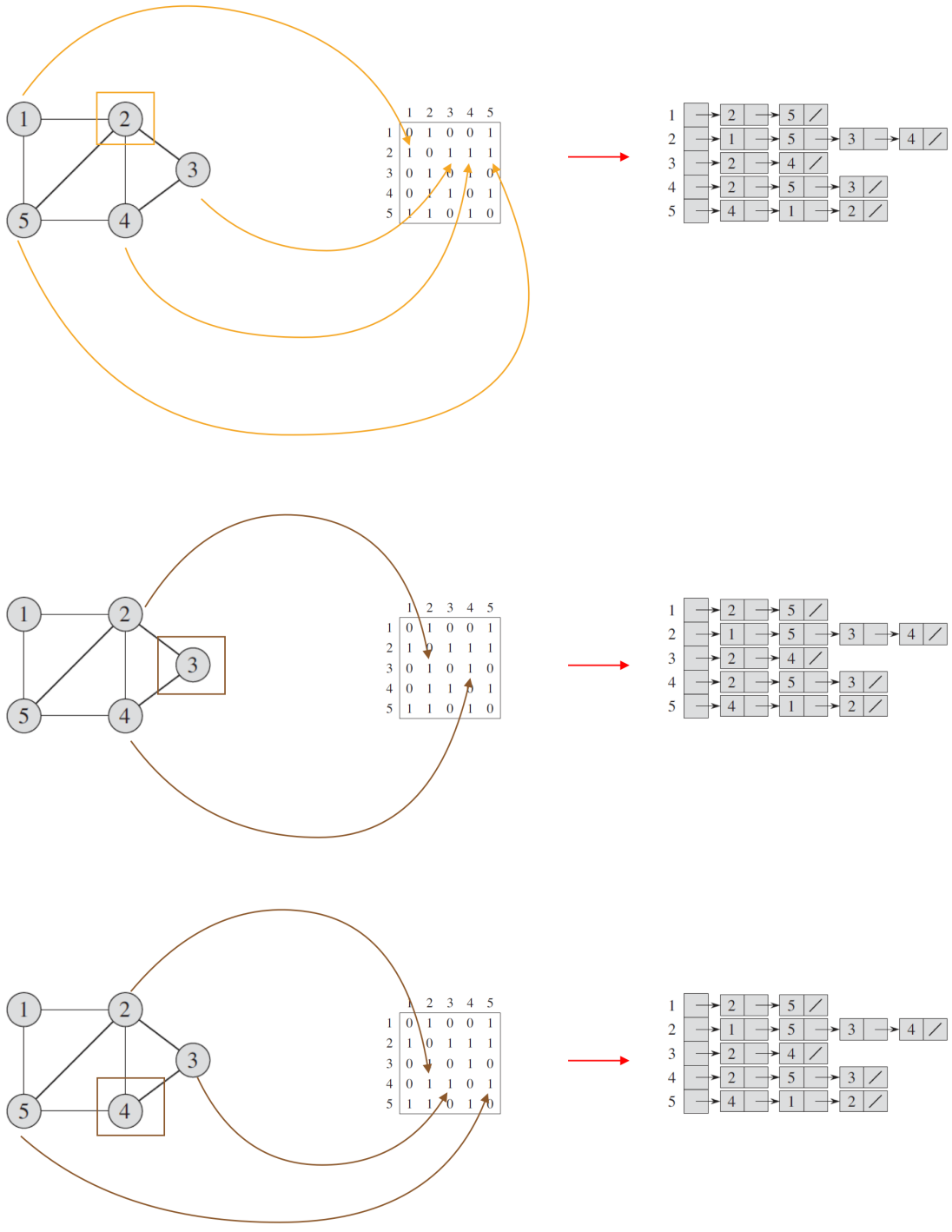
1. **Notes:**

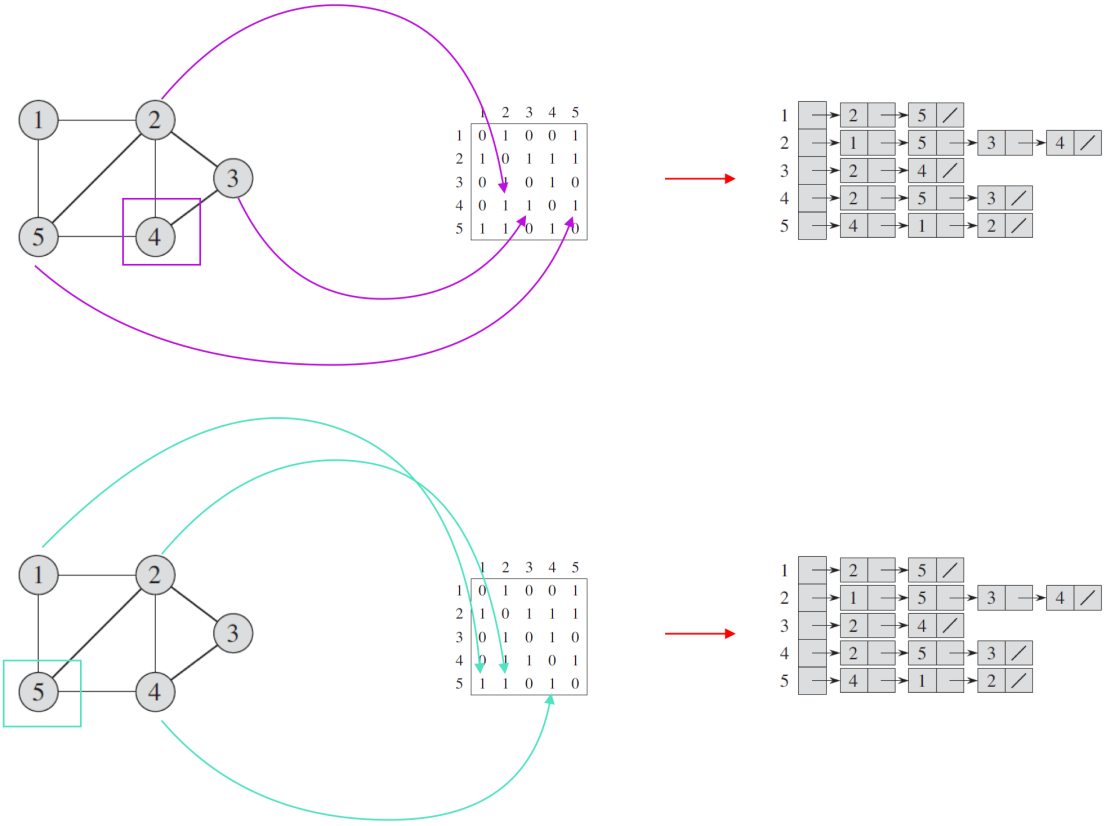
- **Vertex**
  - Is a fundamental unit of which graphs are formed
  - Also means node



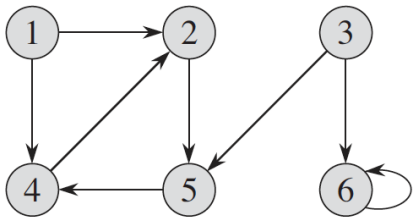
- **Adjacency-list Representation**
  - Associates each vertax in a graph with the collection of its neighbouring vertices or edges



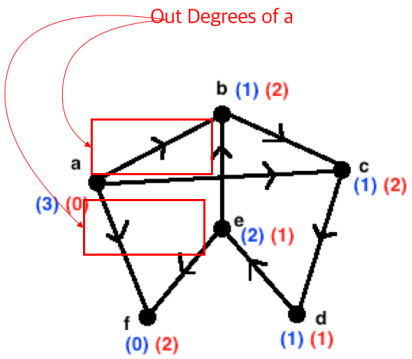

1 2 3 4 5
1 0 1 0 0 1
2 1 0 1 1 1
3 0 1 0 1 0
4 0 1 1 0 1
5 1 1 0 1 0
1 → 2 → 5 /
2 → 1 → 5 → 3 → 4 /
3 → 2 → 4 /
4 → 2 → 5 → 3 /
5 → 4 → 1 → 2 /



- **Directed graph**
  - Is a graph that is made up of a set of vertices connected by edges, where the edges have a direction associated with them



- **Out-degrees**
  - For a directed graph $G = (V(G), E(G))$ and a vertex $x_1 \in V(G)$, the Out-Degree of x_1 refers to the number of arcs incident from x_1. That is, the number of arcs directed away from the vertex x_1.



- **In-degrees**
  - For a directed graph $G = (V(G), E(G))$ and a vertex $x_1 \in V(G)$, the Out-Degree of x_1 refers to the number of arcs incident from x_1. The In-Degree of x_1 refers to the number of arcs incident to x_1. That is, the number of arcs directed towards the vertex x_1.