

## FCS152 Tutorial 10

### Graphs

- Does there exist a simple graph with five vertices of the following degrees? Either draw a graph with the specific properties or explain why such graph does not exist.

a. 3, 2, 3, 2, 3

b. 2, 3, 2, 2, 5

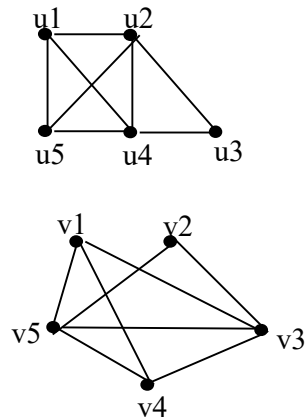
c. 1, 1, 1, 2, 3

- Suppose that  $G$  is a graph with  $v$  vertices and  $e$  edges and the degree of each vertex is at least  $d_{\min}$  and at most  $d_{\max}$ . Show that:

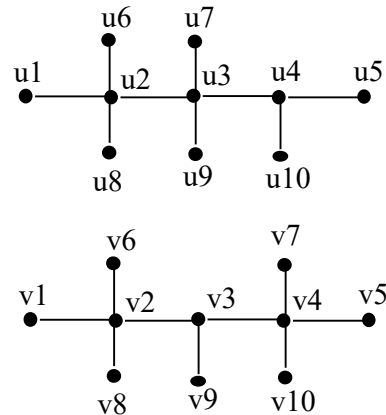
$$\frac{1}{2} d_{\min} \cdot v \leq e \leq \frac{1}{2} d_{\max} \cdot v$$

- Write the adjacency matrix for each of the following graphs. Determine whether each pairs are isomorphic.

a.



b.



- How many edges are in the complete graph with 5 vertices  $K_5$ ? Can you generalize your findings to give a formula for the number of edges in  $K_n$ ?
- Draw all non-isomorphic simple graphs with 6 vertices and 4 edges.