APPLICATION: THE HANDSHAKE THEOREM

The total degree of a graph is the sum of the degrees of all vertices of the graph.

The Handshake Theorem:

If G is any graph with vertices $v_1, v_2, v_3 \ldots v_n$

$$\text{Total degree of } G = \deg(v_1) + \deg(v_2) + \ldots + \deg(v_n)$$
$$= 2 \cdot (\text{number of edges of } G)$$

- In terms of degree, a loop counts as 2.

- In any graph there is an even number of vertices of odd degree.

- A simple graph is a graph that does not have any loops or parallel edges.

  An edge in such graph with endpoints v, w is denoted by $\{v, w\}$

- A complete graph on n vertices, denoted K_n is a simple graph with n vertices and exactly 1 edge connecting each pair of distinct vertices.

  $$\text{No of edges of } K_n = \frac{n(n-1)}{2}$$

- A complete bipartite graph ~~on~~ (m, n) vertices, denoted $K_{m,n}$ is a simple graph whose vertices are divided into 2 distinct subsets: V with m vertices and W with n vertices.