Graph Basics

- $G = (V, E)$ – graph G with vertex set V and edge set E
- $V(G)$ – vertex set of graph G
- $E(G)$ – edge set of graph G
- $d(v)$ – degree (number of incident edges) of vertex v in an undirected graph
- $d^+(v), d^-(v)$ – out/in-degree of vertex v in a directed graph, respectively
- $N(v)$ – neighborhood (set of adjacent vertices) of vertex v in an undirected graph
- $N^+(v), N^-(v)$ – out/in-neighborhood of vertex v in a directed graph, respectively

Specific Types of Graph and Graph Operations

- K_n – complete graph on n vertices
- $K_{m,n}$ – complete bipartite graph on m and n vertices
- P_n – path with n vertices
- C_n – cycle with n vertices
- Q_k – k-dimensional hypercube
- $\overline{G}$ – complement of graph G
- G^* – dual of planar graph G
- $G \vee H$ – Join of graphs G and H
- $G \,\square\, H$ – Cartesian product of graphs G and H
- $G \cong H$ – graph G is isomorphic to graph H

Graph Properties

- $\Delta(G)$ – maximum degree of undirected graph G
- $\Delta^+(G), \Delta^-(G)$ – maximum out/in-degree of directed graph G, respectively
- $\delta(G)$ – minimum degree of undirected graph G
- $\delta^+(G), \delta^-(G)$ – minimum out/in-degree of directed graph G, respectively
- $\alpha(G)$ – independence number (size of largest independent set) of graph G
- $\alpha'(G)$ – size of maximum matching (set of disjoint edges) in graph G
- $\omega(G)$ – clique number (size of largest clique) of graph G
- $\chi(G)$ – chromatic number (minimum number of colors needed in a proper coloring) of graph G
- $\chi'(G)$ – edge chromatic number of graph G