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B8.5 Graph Theory

Jiaming (George) Yu

jiaming.yu@jesus.ox.ac.uk

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1 Graph Theory Basics

In all definitions below, we assume $G = (V, E)$ is any graph.

1.1 Degrees

Definition 1.1 (Degree)

The degree of a vertex v , denoted $d_G(v)$ or simply $d(v)$, is the number of its incident edges.

$$d_G(v) = |\{w \in V : vw \in E\}|$$

If $d_G(v) = 0$, then we say v is an isolated vertex.

Definition 1.2 (Neighbor)

A vertex w is a neighbor of another vertex v if v and w are adjacent.

The neighborhood of v , denoted $N_G(v)$ or simply $N(v)$, is the set of all neighbors of v .

$$N_G(v) = \{w \in V : vw \in E\}$$

Definition 1.3 (Regular)