Graph Algorithms

Robin Whitty at www.theoremoftheday.org

Glossary

Term	Definition	Key Words	Reference
adjacent	two vertices are adjacent if they are joined by an edge		
bipartite	a graph whose vertex set may be partitioned into subsets so that no edge has both endpoints in the same subset	partition, adjacent, subset	Ch. 8 §1
component	a maximal subgraph in which every pair of vertices is connected by a walk	maximal subgraph, walk	
cover	a subset of vertices of a graph such that every edge has at least one endpoint in the subset	subset, vertices, endpoint	Ch. 8 §2
cycle	a path in which the first and last vertices are identical		Ch. 10 §1
degree	the number of edges incident with a vertex		
edge	a connection between two vertices (or from a vertex to itself)		
endpoint	the endpoints of an edge are the vertices incident with it		
Euler tour	a closed trail which passes every edge	closed, trail	Ch. 10 §1
Eulerian	admitting an Euler tour	Euler tour	Ch. 10 §1
flow	a non-negative function on network edges for which net flow (total flow in − total flow out) is zero for all vertices except s and t	function, net flow	Ch. 5 §2
forest	a graph or subgraph whose connected components are trees	subgraph, components, trees	Ch. 3 §1
f-unsaturated path	a network path in which flow values forward are less than capacity and flow values backward are greater than zero	network, capacity, forward, backward	Ch. 6 §1
incident	an edge is incident with a vertex if it joins that vertex to another (or to the same by a loop)		
indegree	the number of network edges directed into a vertex		
loop	an edge connecting a vertex to itself		
M-unsaturated vertex	a vertex which appears in no edge of matching M	matching, vertex	Ch. 8 §3
M-alternating path	a path whose edges are alternately matching and non-matching edges	matching, non-matching	Ch. 8 §3
matching	an edge subset for which no vertex appears in more than one edge of the subset	subset, edge, vertex	Ch. 8 §1
M-augmenting path	an M-alternating path whose first and last vertices are M-unsaturated	alternating, unsaturated	Ch. 8 §3
maximal	a set which cannot have more elements added without losing some specified property		
maximum	a largest subset having some specified property		
minimal	a set which cannot have elements removed without losing some specified property		
minimum	a smallest subset having some specified property		
minimum weight	having total (edge) weight as small as possible		Ch. 2 §2
network	a digraph with a specified source (s) and target (t) vertex		Ch. 5 §1
outdegree	the number of network edges directed out of a vertex		
path	a walk which repeats no vertices (except possibly its first and last = a cycle)	walk, repeat	Ch. 10 §1
perfect matching	a matching which is spanning	matching, spanning	Ch. 8 §1
st-cut	a subset of network edges whose deletion removes all walks from s to t in the network	subset, edges, deletion, st-walks	Ch. 5 §3
spanning	containing all vertices of a specified graph		Ch. 3 §1
subgraph	a subset of vertices of a graph and a subset of edges incident with those vertices		
trail	a walk which repeats no edges	walk, repeat	Ch. 10 §1
tree	a graph or subgraph which is connected and has no cycles	subgraph, connected, no cycles	
vertex	a point or node whose connections with other points or nodes is to be studied		
walk	a consecutive sequence of edges		Ch. 10 §1
weight	value of a real or non-negative function on the edges of a graph		