Notation

Strings, arrays, sets

i, j, k, n	Integer numbers.
$[i..j]$, $\|[i..j]\|$	The set of integers $\{i, i+1, \ldots, j-1, j\}$ and its cardinality $j-i+1$.
$\mathbb{I}(x,y)$, $\mathbb{I}(x)$	A function that returns the set of integers $[i..j]$ associated with the pair of objects (x, y). We use $\mathbb{I}(x)$ when y is clear from the context.
$\overleftrightarrow{x}, \overleftarrow{x}, \overrightarrow{x}, \|\overleftrightarrow{x}\|$	Assume that $\mathbb{I}(x,y) = [i..j]$, where both function $\mathbb{I}$ and object y are clear from the context. Then, $\overleftrightarrow{x} = [i..j]$, $\overleftarrow{x} = i$, $\overrightarrow{x} = j$, and $\|\overleftrightarrow{x}\| = \|[i..j]\|$.
$\Sigma = [1..\sigma]$	Alphabet of size σ. All integers in Σ are assumed to be used.
$\Sigma \subseteq [1..u]$	An ordered alphabet, in which not all integers in $[1..u]$ are necessarily used. We denote its size $\|\Sigma\|$ with σ.
a, b, c, d	*Characters*, that is, integers in some alphabet Σ. We also call them *symbols*.
$T = t_1 t_2 \cdots t_n$	A *string*, that is, a concatenation of characters in some alphabet Σ, with character t_i at position i. We use the term *sequence* in a biological context.
$T \cdot S$, $t \cdot s$	Concatenation of strings T and S or multiplication of integers t and s, with the operation type being clear from the context. We sometimes omit $\cdot$ if the operands of the concatenation/multiplication are simple.
$T = \mathtt{ACGATAGCTA}$	A *string*, with characters given explicitly and represented as letters of the English alphabet.
$\underline{T}$	The *reverse* of a string T, i.e. string T read from right to left.
$\underset{\smile}{T}$	The *reverse complement* of a DNA sequence T, that is, string T read from right to left, replacing `A` with `T` and `C` with `G`, and vice versa.
$T_{i..j}$	The *substring* $t_i t_{i+1} \cdots t_{j-1} t_j$ of string T induced by the indexes in $[i..j]$.
$T[i..j]$	Equivalent to $T_{i..j}$, used for clarity when i or j are formulas rather than variables.

subsequence	A string $t_{i_1} t_{i_2} \cdots t_{i_k}$ obtained by selecting a set of positions $1 \leq i_1 < i_2 < \cdots < i_k \leq n$ and by reading the characters of a string $T = t_1 t_2 \cdots t_n$ at those positions. In a biological context, subsequence is used as a synonym of substring.
$\mathcal{S} = \{T^1, T^2, \ldots, T^n\}$	Set of strings, with T^i denoting the ith string.
$\Sigma^*, \Sigma^+, \Sigma^n$	The set of all strings over alphabet Σ, the set of all non-empty strings over alphabet Σ, and the set of strings of length n over alphabet Σ, respectively. We use shorthand $A = a^n$ for $A \in \{a\}^n$, that is, for a string consisting of n occurrences of a.
$\delta(i..j, c)$	A function that maps an interval $[i..j]$ and a character $c \in \Sigma$ onto exactly one interval $[i'..j']$.
$\ldots, \#_2, \#_1, \#_0$	Shorthands for non-positive integers, with $\#_0 = 0$ and $\#_i = -i$.
$\#$	Shorthand for $\#_0$.
$\$_1, \$_2, \ldots$	Shorthands for positive integers greater than σ, with $\$_i = \sigma + i$.
$\$$	Shorthand for $\$_1$.
$A[1..n]$	*Array* A of integers, indexed from 1 to n.
$A[i..j], A[\overset{\bullet\!-\!\bullet}{x}]$	The *subarray* of array A induced by the indexes in $[i..j]$ and in $\overset{\bullet\!-\!\bullet}{x}$, respectively.
$X = (p, s, v)$	*Triplet* of integers, with primary key $X.p$, secondary key $X.s$, and value $X.v$.
$D[1..m, 1..n]$	An *array/matrix* with m rows and n columns.
$D_{i_1..j_1, i_2..j_2}$	*Subarray* of D.
$D[i_1..j_1, i_2..j_2]$	Same as above.
$d_{i,j} = D[i,j]$	An element of the array D.

Undirected graphs

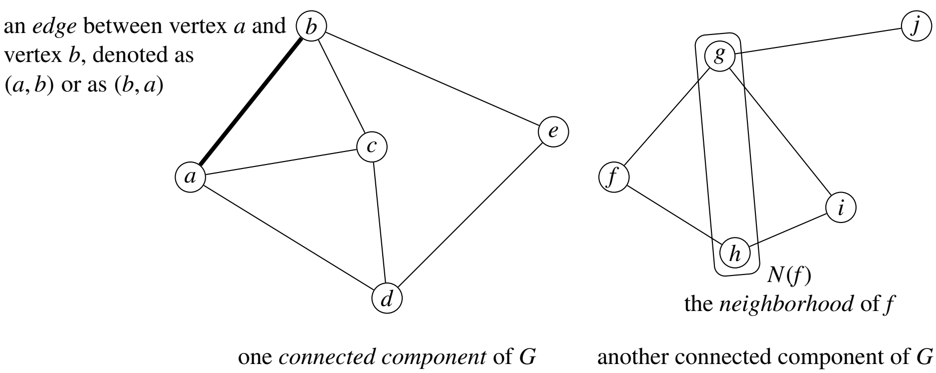

Figure 2 An *undirected graph* $G = (V, E)$, with *vertex* set V and *edge* set E.

$V(G)$	Set V of *vertices* of a graph $G = (V, E)$.
$E(G)$	Set E of *edges* of an undirected graph $G = (V, E)$.
$(x, y) \in E(G)$	An edge of an undirected graph G; the same as (y, x).
$N(x)$	The *neighborhood* of x in G, namely the set $\{y \mid (x, y) \in E(G)\}$.

Directed graphs

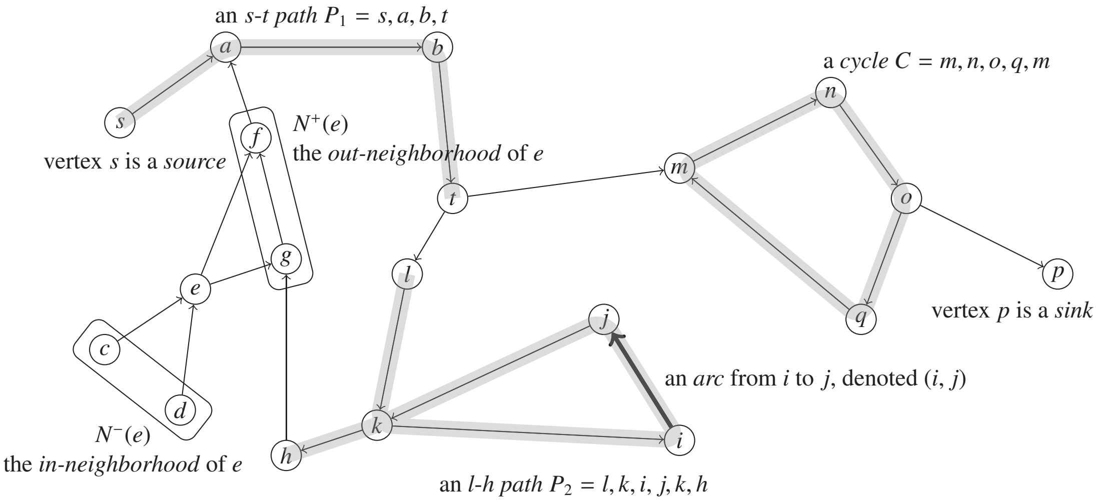

Figure 3 A *directed graph* $G = (V, E)$, with *vertex* set V and *arc* set E.

$(x, y) \in E(G)$	An arc of a directed graph G; the arc (x, y) is different from (y, x).
$N^-(x)$	The in-neighborhood of x in G, namely the set $\{y \mid (y, x) \in E(G)\}$.
source	A vertex v is a source if $N^-(v) = \emptyset$.
$N^+(x)$	The out-neighborhood of x in G, namely the set $\{y \mid (x, y) \in E(G)\}$.
sink	A vertex v is a sink if $N^+(v) = \emptyset$.
$P = v_1, \ldots, v_k$	A path in G, namely a sequence of vertices of G connected by arcs with the same orientation, from v_1 to v_k; depending on the context, we allow or not P to have repeated vertices.
s-*t* path	Path from vertex s to vertex t.
$C = v_1, \ldots, v_k, v_1$	A cycle in G, namely a path in G in which the first and last vertex coincide; depending on the context, we allow or do not allow C to have other repeated vertices than its first and last elements.
$(x, y) \in S$	Arc $(x, y) \in E(G)$ appears on S, where S is a path or cycle of G.

Trees

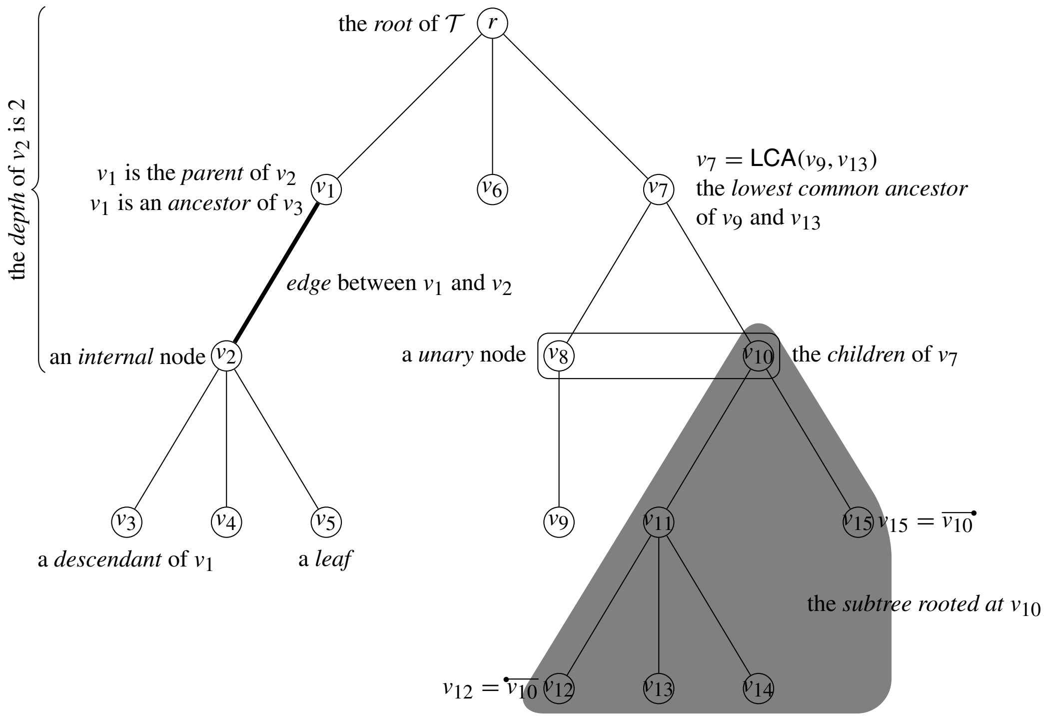

Figure 4 A tree $\mathcal{T} = (V, E)$, with *node* set V and *edge* set E. Unless stated otherwise, we assume all trees to be *ordered*, that is, we assume that there is a total order on the children of every node.

v_2 is a child of v_1	If there is an edge between v_1 and v_2 and v_1 appears on the path from the root to v_2.
v_1 is the parent of v_2	If v_2 is the child of v_1.
degree of a node v	The number of children of v.
leaf	A node with degree 0.
internal node	A node with degree at least 1.
unary node	A node with degree 1.
depth of v	The number of edges of the path from the root to v.
subtree rooted at v	The subtree of $\mathcal{T}$ having root v and consisting of all nodes reachable through a path starting at v made up only of nodes of depth at least the depth of v.
v_2 is descendant v_1	If $v_2 \neq v_1$ belongs to the subtree rooted at v_1.
v_1 is ancestor v_2	If $v_2 \neq v_1$ belongs to the subtree rooted at v_1.
$\mathsf{LCA}(v_1, v_2)$	The *lowest common ancestor* of v_1 and v_2, that is, the deepest node which is an ancestor of both v_1 and v_2.
$\overleftarrow{v}$	The left-most leaf of the subtree rooted at a node v.
$\overrightarrow{v}$	The right-most leaf of the subtree rooted at a node v.