Notation

The notation follows that of Volume 1, with the following exceptions.

- The coefficient of x^n in the power series $F(x)$ is now denoted $[x^n]F(x)$. This notation is generalized in an obvious way to such situations as

$$[x^m y^n] \sum_{i,j} a_{ij} x^i y^j = a_{mn}$$

$$\left[\frac{x^n}{n!}\right] \sum_i a_i \frac{x^i}{i!} = a_n.$$

- The number of inversions, number of descents, and major index of a permutation (or more generally of a sequence) w are denoted $\mathrm{inv}(w)$, $\mathrm{des}(w)$, and $\mathrm{maj}(w)$, respectively, rather than $i(w)$, $d(w)$, and $\iota(w)$. Sometimes, especially when we are regarding the symmetric group $\mathfrak{S}_n$ as a Coxeter group, we write $\ell(w)$ instead of $\mathrm{inv}(w)$.

The following notation is used for various rings and fields of generating functions. Here K denotes a field, which is always the field of coefficients of the series below. All Laurent series and fractional Laurent series are understood to have only finitely many terms with negative exponents.

$K[x]$	ring of polynomials in x
$K(x)$	field of rational functions in x (the quotient field of $K[x]$)
$K[[x]]$	ring of formal (power) series in x
$K((x))$	field of Laurent series in x (the quotient field of $K[[x]]$)
$K_{\mathrm{alg}}[[x]]$	ring of algebraic power series in x over $K(x)$
$K_{\mathrm{alg}}((x))$	field of algebraic Laurent series in x over $K(x)$
$K^{\mathrm{fra}}[[x]]$	ring of fractional power series in x

$K^{\text{fra}}((x))$	field of fractional Laurent series in x (the quotient field of $K^{\text{fra}}[[x]]$)
$K\langle X\rangle$	ring of noncommutative polynomials in the alphabet (set of variables) X
$K_{\text{rat}}\langle\langle X\rangle\rangle$	ring of rational (= recognizable) noncommutative series in the alphabet X
$K\langle\langle X\rangle\rangle$	ring of formal (noncommutative) series in the alphabet X
$K_{\text{alg}}\langle\langle X\rangle\rangle$	ring of (noncommutative) algebraic series in the alphabet X