

Pensieve header: Producing polynomials with generic coefficients.

In[*]:= ? Map

Symbol i

Map[f, expr] or f /@ expr applies f to each element on the first level in expr.

Out[*]:= Map[f, expr, levelspec] applies f to parts of expr specified by levelspec.

Map[f] represents an operator form of Map that can be applied to an expression.

In[*]:= Join@@ (Permutations /@ IntegerPartitions[5 + 3, {3}]) - 1

Out[*]:= {{5, 0, 0}, {0, 5, 0}, {0, 0, 5}, {4, 1, 0}, {4, 0, 1}, {1, 4, 0}, {1, 0, 4},
 {0, 4, 1}, {0, 1, 4}, {3, 2, 0}, {3, 0, 2}, {2, 3, 0}, {2, 0, 3}, {0, 3, 2},
 {0, 2, 3}, {3, 1, 1}, {1, 3, 1}, {1, 1, 3}, {2, 2, 1}, {2, 1, 2}, {1, 2, 2}}

In[*]:= Flatten[Permutations /@ IntegerPartitions[5, {3}]]

Out[*]:= {3, 1, 1, 1, 3, 1, 1, 1, 3, 2, 2, 1, 2, 1, 2, 1, 2, 2}

In[*]:= GenericPolynomial[d_Integer, vars_List, gc_] := Total[Map[
 gcSequence@@# Times@@ (vars#) &,
 Join@@ (Permutations /@ IntegerPartitions[d + Length@vars, {Length@vars}]) - 1
]]

In[*]:= GenericPolynomial[3, {x, y, z}, c]

Out[*]:= z³ c_{0,0,3} + y z² c_{0,1,2} + y² z c_{0,2,1} + y³ c_{0,3,0} +
 x z² c_{1,0,2} + x y z c_{1,1,1} + x y² c_{1,2,0} + x² z c_{2,0,1} + x² y c_{2,1,0} + x³ c_{3,0,0}

In[*]:= Split[{1, 1, 2, 1, 1, 2, 1}]

Out[*]:= {{1, 1}, {2}, {1, 1}, {2}, {1}}

In[*]:= GenericPolynomial[0, {x, y, z}, c]

Out[*]:= c_{0,0,0}

In[*]:= Table[GenericPolynomial[d, Table[x_i, {i, n}], c], {d, 0, 3}, {n, 0, 3}] // MatrixForm

Out[*]//MatrixForm=

Subscript[c]	c ₀	c _{0,0}			
0	c ₁ x ₁	x ₂ c _{0,1} + x ₁ c _{1,0}			
0	c ₂ x ₁ ²	x ₂ ² c _{0,2} + x ₁ x ₂ c _{1,1} + x ₁ ² c _{2,0}	x ₃ ² c _{0,0,2} + x ₂ x ₃ c _{1,0,1}		
0	c ₃ x ₁ ³	x ₂ ³ c _{0,3} + x ₁ x ₂ ² c _{1,2} + x ₁ ² x ₂ c _{2,1} + x ₁ ³ c _{3,0}	x ₃ ³ c _{0,0,3} + x ₂ x ₃ ² c _{0,1,2} + x ₂ ² x ₃ c _{0,2,1} + x ₂ ³ c _{0,3,0}		