

(2nd March)

Integer Partitions of I_n

All k tuples $\lambda = (\lambda_1 \lambda_2 \dots \lambda_k)$ where $\lambda_1 \geq \lambda_2 \dots \geq \lambda_k$ and $\lambda_1 + \lambda_2 + \dots + \lambda_k = n$. (decreasing).

"superscript/multiplicative" notation

$$\lambda = \lambda_1^{p_1} \lambda_2^{p_2} \dots \lambda_m^{p_m} \quad (1)$$

eg; $\lambda = (5, 5, 5, 3, 2, 2, 1, 1)$ can be expressed as $5^3 3^2 2^2 1^3$.

Then there is also the pictorial representation... imagine a 2D plane. The number of blocks in this representation adds to n . And in decreasing order from top to bottom you'd lay out horizontally the blocks quantities for each partition of n . This motivates the idea of a conjugate partition λ' . (bijective).

Theorem

The number of partitions of n with k parts is equal to the number of partitions of n with the greatest part equal to k .

visually proven using the conjugate mapping shown via the pictorial representation

Reverse Lexicographic Order

Lexic, Colex, Reverse Lex are the orderings covered so far.

For $n = 4$, example of "Reverse Lex".

4
31
211
1111

For $n = 5$, example of "Reverse Lex".

5
41
32
311
221
2111
11111

Michael mentioned a successor function here, we should code it up (it is now).