(2nd March)

Integer Paritions of I_n

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

"superscript/multiplicitive" notation

$$\lambda = \lambda_1^{p_1} \lambda_2^{p_2} ... \lambda_m^{p_m} \tag{1}$$

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

Then there is also the pictorical 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 parition of n. This motivates the idea of a conjugate partition λ'. (bijective).

Theorem

The number of paritions of n with k parts is equal to the number of paritions 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.