Summations

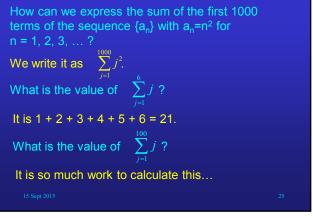
What does $\sum_{j=1}^{n} a_j$ stand for?

It represents the sum $a_m + a_{m+1} + a_{m+2} + \ldots + a_n$.

The variable j is called the *index of summation*, running from its *lower limit* m to its *upper limit* n. We could as well have used any other letter to denote this index.

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Summations



Summations

It is said that Friedrich Gauss came up with the following formula:

$$\sum_{j=1}^{n} j = \frac{n(n+1)}{2}$$

When you have such a formula, the result of any summation can be calculated much more easily for exampte:

$$\sum_{j=1}^{100} j = \frac{100(100+1)}{2} = \frac{10100}{2} = 5050$$

Double Summations

Corresponding to nested loops in C or Java, there is also double (or triple etc.) summation:

