Hint for Problem 152-b

In the equation $\sum_{j=0}^{n} n^{\underline{j}} S(k, j) = n^k$, we might try substituting x for n. However we don't know what $\sum_{j=0}^{x}$ means when x is a variable. Is there anything other than n that makes a suitable upper limit for the sum? (Think about what you know about $S(k, j)$.)