Problem Statement by Harish Chandra Rajpoot

If a given word/positive integral number has total $'n'$ number of the letters/non-zero digits, out of which numbers of repetitive letters/non-zero digits are $p, q, r, s, \ldots\ldots\ldots$ then total number (N) of the words/numbers formed by permuting all the letters/non-zero digits together is given as

$$N = \frac{n!}{p!\, q!\, r!\, s! \ldots\ldots} = \sum_{i=1}^{i=n} F_i \left(\frac{P_i}{S_i}\right)$$

Where summation denotes the alphabetic/numeric (increasing or decreasing) order of last word/number when the total words/numbers (permutations) formed are arranged in their actual alphabetic/numeric order.

Above summation is named as HCR's Rank Formula.

Where, the symbols have their unusual meanings as $F \rightarrow Formerity, S \rightarrow Similarity$ $P \rightarrow Permuty, relevant\ to\ each\ selected\ letter\ or\ non\ zero\ digit$, but usual way to find out their respective values

Note: Above Equality had been proposed & proved by H. C. Rajpoot. It is based on inverse relation in his research paper.

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