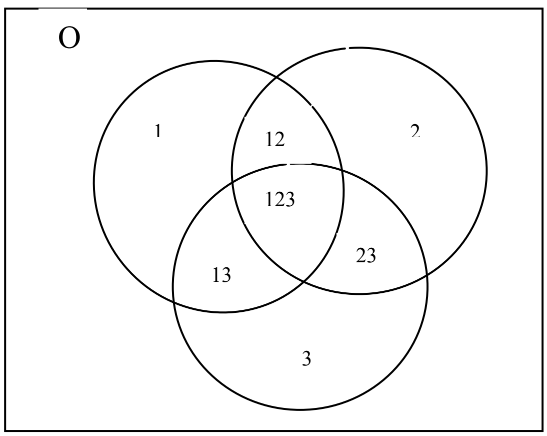
Smarandache's codification used in computer programming

Since Venn diagram is very hard to draw and to read for the cases when the number of sets becomes big (say n = 8, 9, 10, 11, …), Smarandache has proposed a generalization of Venn diagram through an *algebraic representation* for the intersection of sets.
Let $n \geq 1$ be the number of sets $S_1, S_2, \ldots, S_n$, that are to be intersected in all possible ways in a Venn diagram. Let $1 \leq k \leq n$ be an integer.
He noted by: $i_1\ i_2 \ldots i_k$ the Venn diagram region that belongs to the sets Si_1 and Si_2 and … and Si_k only, for all k and all n.
The part which is outside of all sets (i.e. the complement of the union of all sets) is noted by 0 (zero).
Each Venn diagram will have 2^n disjoint parts, and each such disjoint part (except the above part 0) will be formed by combinations of k numbers from the numbers: 1 2 3 … n.
Let see an example of **Smarandache's codification**, for n = 3, for sets S_1, S_2, and S_3.



Therefore, part 12 means that part which belongs to S_1 and S_2 only; part 3 means that part which belongs to S_3 only.
This helps to the construction of a base formed by all these disjoint parts, and implementation in a computer program of each set from the power set $\mathcal{P}(S_1 \cup S_2 \cup \ldots \cup S_n)$ by a unique combination of numbers 1, 2, …, n.
When $n \geq 10$, one uses one space in between numbers: for example, if we want to represent the disjoint part which is the intersection of S_3, S_{10}, and S_{27} only, he used the notation [3 10 27], with blanks in between set indexes.

Smarandache's codification is user friendly in algebraically doing unions and intersections in a simple way. Union of sets $S_a, S_b, \ldots, S_v$ is formed by all disjoint parts that have in their index either the number a, or the number b, …, or the number v.
While intersection of $S_a, S_b, \ldots, S_v$ is formed by all disjoint parts that have in their index all numbers a, b, …, v.
For n = 3 and the diagram above:
$S_1 \cup S_{23}$ = {1, 12, 13, 23, 123}, i.e. all disjoint parts that include in their indexes either the number 1, or the number 23.
$S_1 \cap S_2$ = {12, 123}, i.e. all disjoint parts that have in their index the numbers 12.