Permutation and combination

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AND & OR are mostly used in set theory during computations involved in permutations and combination. There exist differences between AND & OR because they are used in different areas and to get distinctive results. The OR logic can be used in the cases when an object meets at least one criteria with the workflow enrollment or list of filters. On the other hand, the AND logic is only used when the object under consideration meets all the requirements in the group. In other words, the logic AND represents that both conditions under consideration must be met when combining two or more pieces logic[[1]](#footnote-1). This is in contrast to OR because the combination of the element can be completed when at least one condition is met. We can use the truth table to show the difference between the AND & OR below. We will use 1 to represent 'TRUTH' and 0 to represent 'FALSE.' In this case, we will consider 'q' and 'r' as our elements.

AND

|  |  |  |
| --- | --- | --- |
| q | r | q AND r |
| 1 | 1 | 1 |
| 1 | 0 | 0 |
| 0 | 1 | 0 |
| 0 | 0 | 0 |

From the above table, q AND r is only true when both q and r is true

OR

|  |  |  |
| --- | --- | --- |
| q | r | q OR r |
| 1 | 1 | 1 |
| 1 | 0 | 1 |
| 0 | 1 | 1 |
| 0 | 0 | 0 |

The above table shows that q OR r is true when either q or r is true

We can as well use mathematical inequalities to show the difference that exists between AND&OR. For instance, when we say x ≤ 4, it means that x=4 or x < 4. If p: x = 4 and q: x < 4 and x = 2 then p will be false while q will be true. X ≤ 4 will still be true. On the other hand, can use another statement to represent AND. If we take 2 < x > 8, it means that x>2 and x<8. Let p: x>2 and q: x<8. If x=1, then p becomes false and q becomes true. The whole statement becomes false because all conditions are not met.

Finally, AND can be used to show multiplication while OR can be used to represent addition mostly in the calculations of probability. For example;

P (A and B) = P (A). P (B) for AND. For the case of OR it is calculated as P (A or B) = P (A) +P (B).

Bibliography

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1. , "Software survey section," Computers & Mathematics with Applications 20, no. 1 (1990): xx, doi:10.1016/0898-1221(90)90073-s [↑](#footnote-ref-1)