**Permutation / Arrangement**

In permutations/arrangements the order of objects is very important. The arrangement must be in the stipulated order of the number of objects, taken only some or all at a time.

We define permutation as different ways of arranging some or all the members of a set in a specific order. It implies all the possible arrangement or rearrangement of the given set, into distinguishable order.

For example, all possible permutation created with letters x, y, z –

* By taking all three at a time are xyz, xzy, yxz, yzx, zxy, zyx.
* By taking two at a time are xy, xz, yx, yz, zx, zy.

Total number of possible permutations of n things, taken r at a time, can be calculated as:



In the example above

Taking all 3 $3.2=6$

Taking 2 at a time $\frac{3!}{\left(3-2\right)!}= \frac{3!}{\left(1\right)!}=3.2=6$