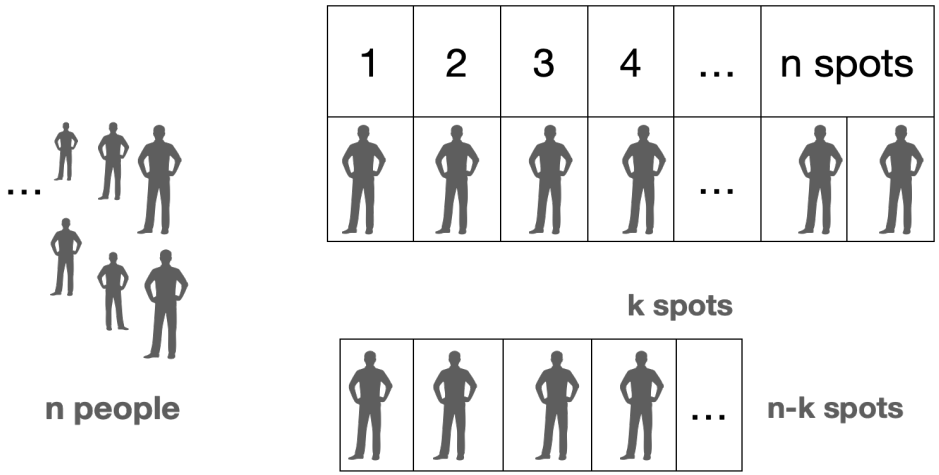
Permutation – Counting for the queue



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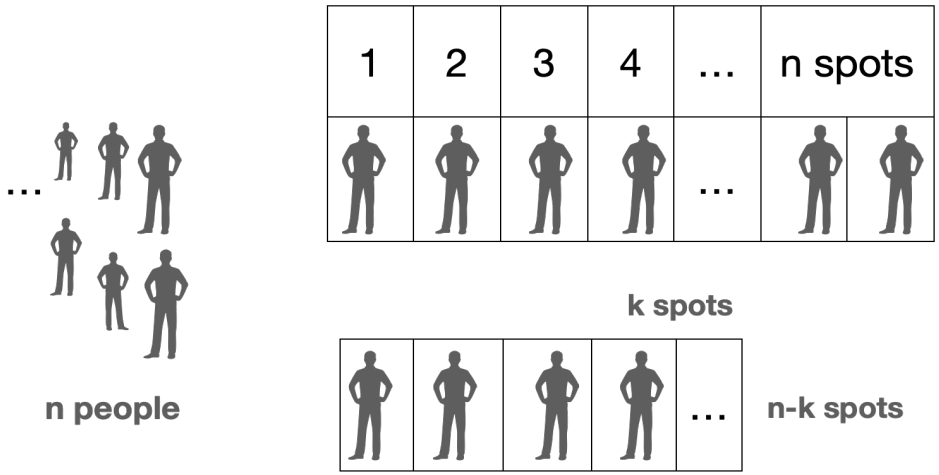

Queue with no size limitation

$$n! = n \times (n-1) \times (n-2) \times ... \times 1$$

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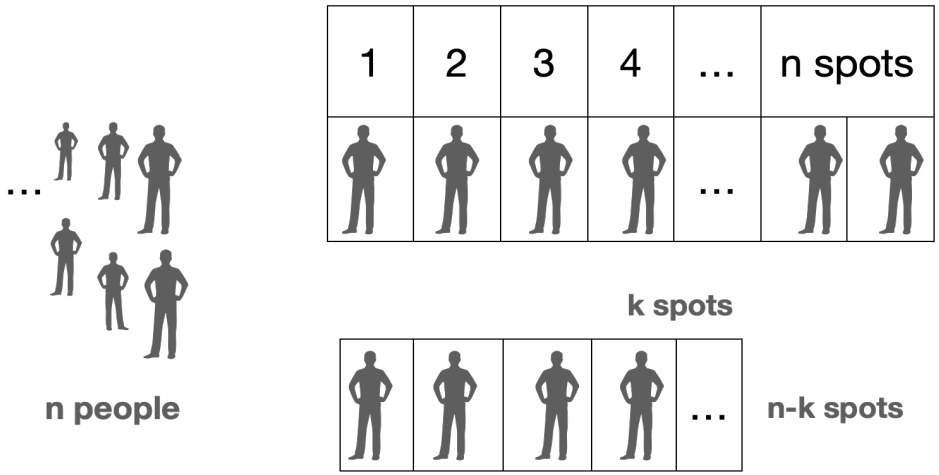

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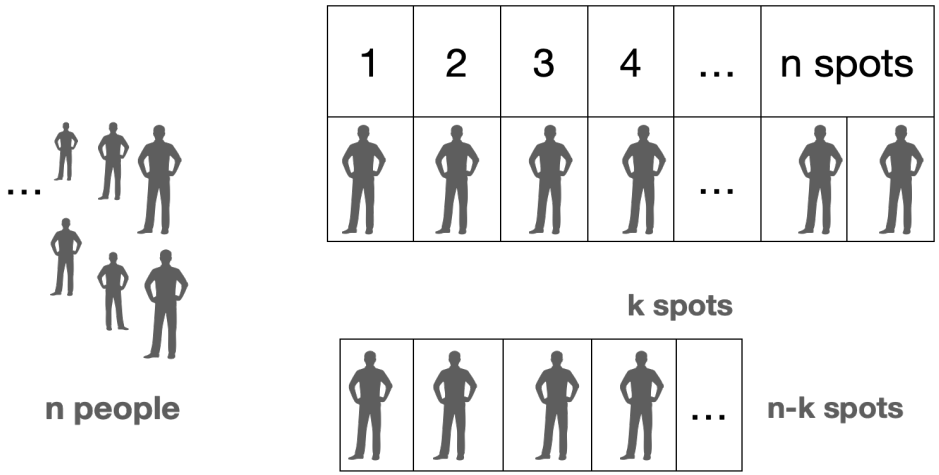

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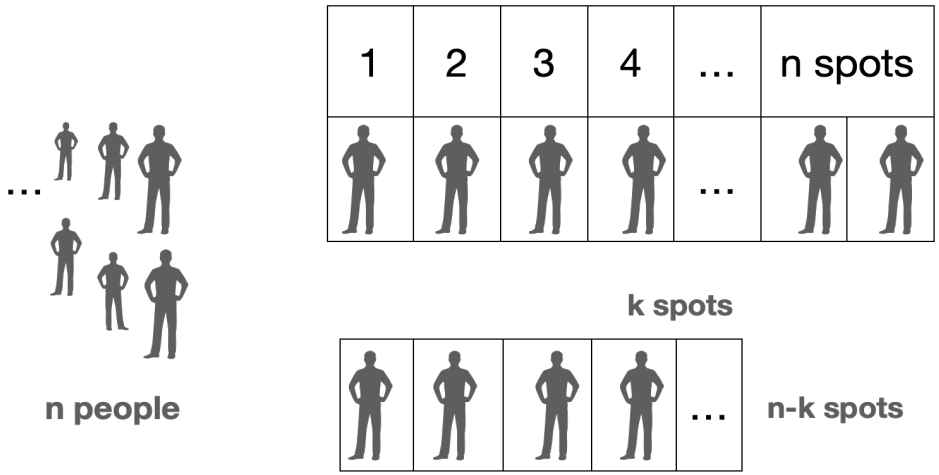

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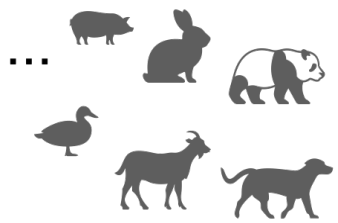
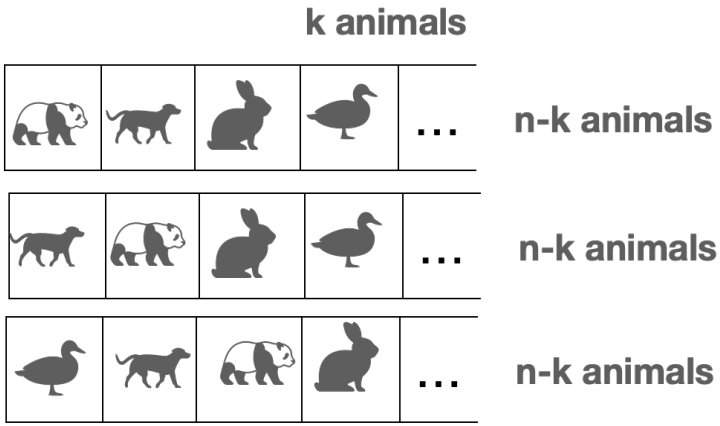
When $k = n$, $_nP_k = n \times (n-1) \times (n-2) \times ... \times 1$

Combination – Counting for the group



n animals



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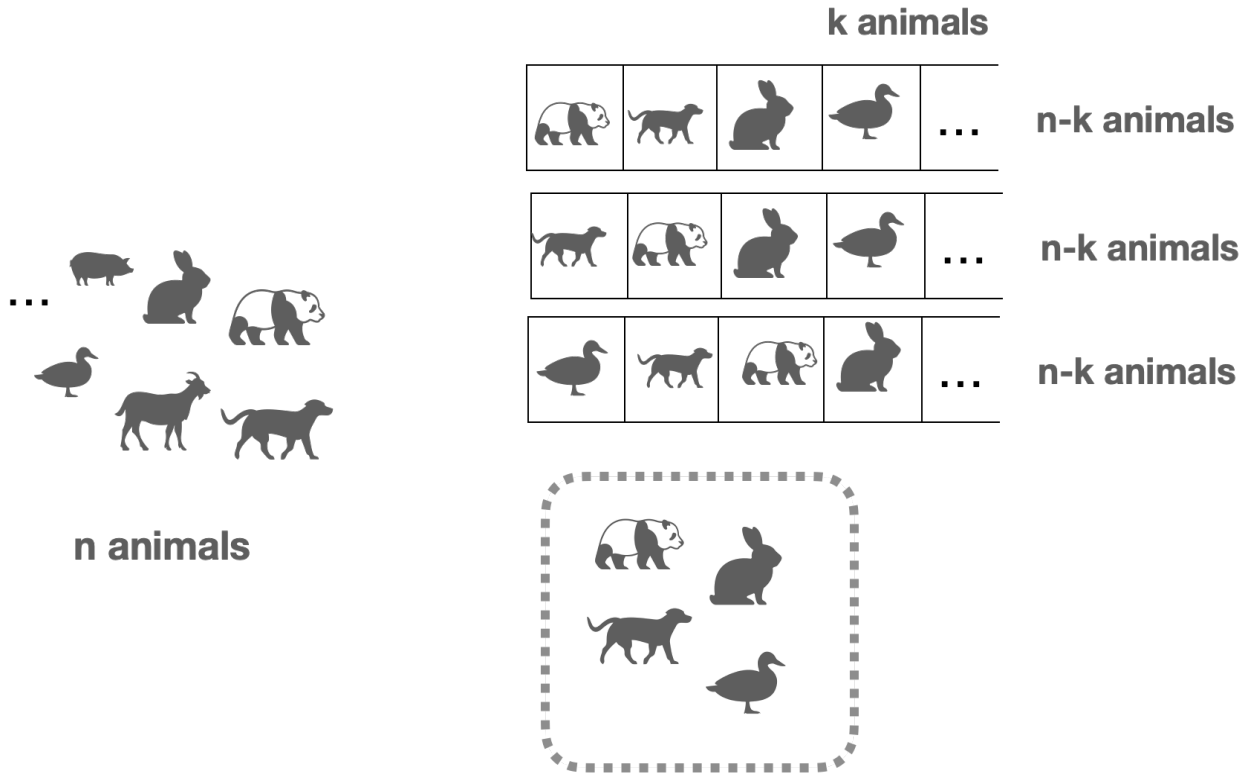

Choose k items from a collection of n items

$$\binom{n}{k} = \frac{{}_nP_k}{k!} = \frac{n!}{(n-k)! \times k!}$$

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- *Sum rule:* if $S_1 \cap S_2 = \emptyset$, then $|S_1 \cup S_2| = |S_1| + |S_2|$.

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Q & A