





- If O₁ and O₂ are outcomes and the pair (O₁, O₂) is different from (O₂, O₁), then we have an **ordered pair**.
- If O₁ can be selected in n₁ ways and O₂ can be selected in n₂ ways, then the *number* of ordered pairs is

 $n_1 n_2$



EXAMPLE

- In the previous situation:
- Suppose airline A₅ had a deal with cab company C₁ to provide heavily discounted cab fare
 - So anyone flying with $A_{\scriptscriptstyle 5}$ would choose $C_{\scriptscriptstyle 1}$ for their cab
- How many possible pairs of companies are there now?
 - The product rule will **not** apply anymore!
- Use a tree diagram to help







EXAMPLES

- Suppose a little league baseball team has 15 players on its roster.
- How many ways are there to select 9 players to form a starting lineup?
- The campus bookstore has 10 laptop models.
- How many ways can it display 3 at a time?

PERMUTATION

• Another word for an ordered subset

 The number of permutations of size k that can be formed from the n objects in a group is denoted by P_{k,n}.

$$P_{k,n} = \frac{n!}{(n-k)!}$$

m! = m(m-1)(m-2)...(2)(1)







