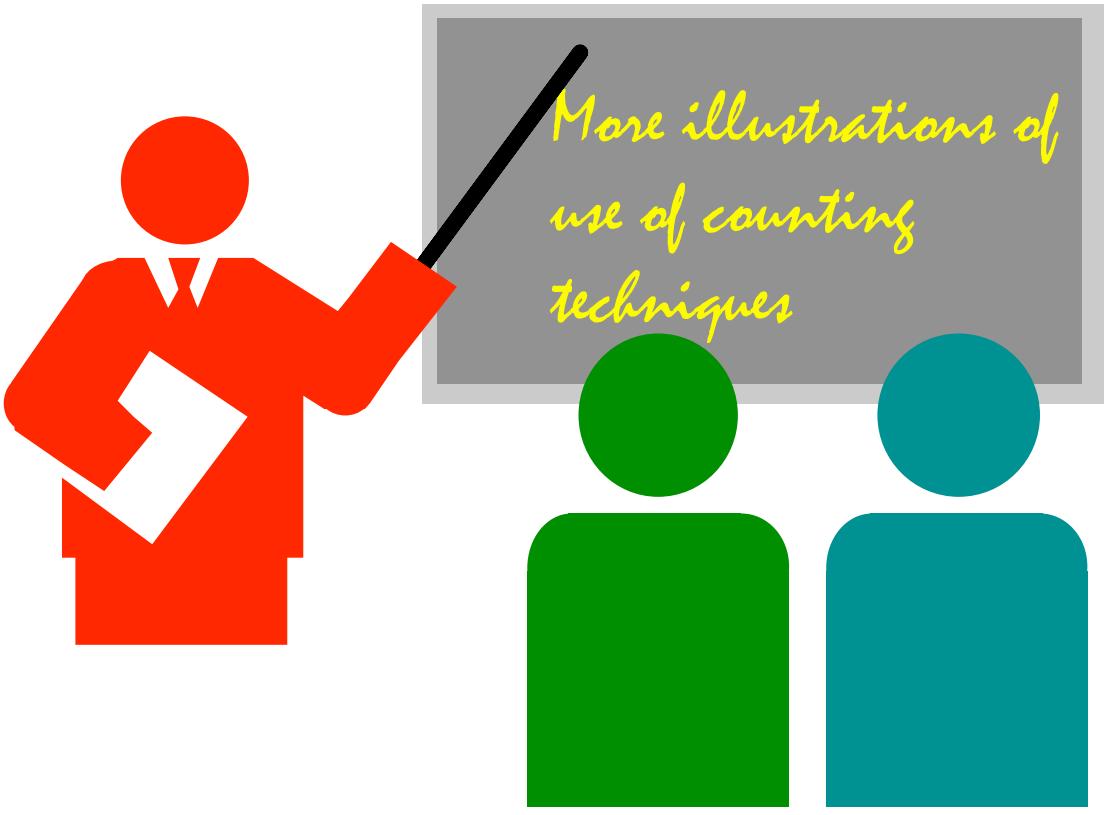

Scheduling Speakers

A meeting is to be addressed by people named Smith, Jones, Watt, Evans, and Fudd. In how many ways can the order of the speakers be arranged if Fudd insists on speaking before Watt?

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Watt Evans Fudd	Watt Fudd Evans	Evans Fudd Watt	Evans Watt Fudd	Fudd Evans Watt	Fudd Watt Evans

Simplified problem

A meeting is to be addressed by people named Watt, Evans, and Fudd. In how many ways can the order of the speakers be arranged if Fudd insists on speaking before Watt?

Watt Evans Fudd	Watt Fudd Evans	Evans Fudd Watt	Evans Watt Fudd	Fudd Evans Watt	Fudd Watt Evans

Answer = 3

A meeting is to be addressed by people named Smith, Jones, Watt, Evans, and Fudd. In how many ways can the order of the speakers be arranged if Fudd insists on speaking before Watt?

How many possibilities with Fudd speaking first?

Fudd
????
????
????
????

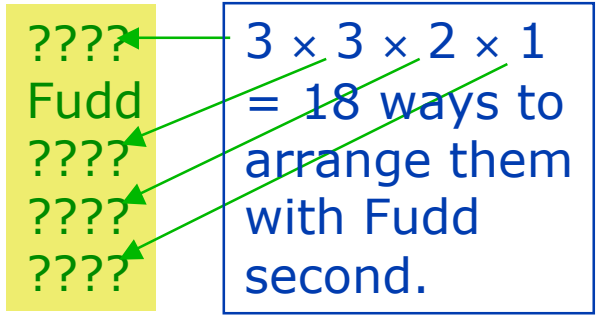
A meeting is to be addressed by people named Smith, Jones, Watt, Evans, and Fudd. In how many ways can the order of the speakers be arranged if Fudd insists on speaking before Watt?

How many possibilities with Fudd speaking first?

Fudd
????
????
????
????

4! = 24 ways with Fudd first

How many possibilities with Fudd speaking second?



How many possibilities with Fudd speaking second?

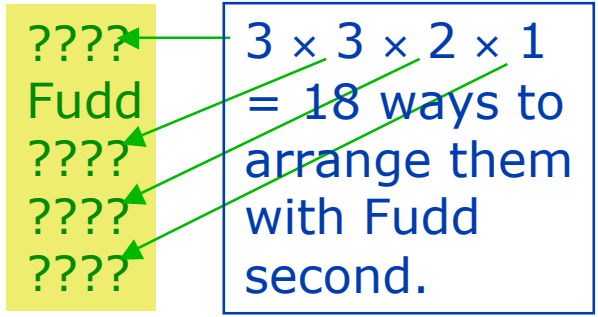
????
Fudd
????
????
????

$3 \times 3 \times 2 \times 1 = 18$ ways to arrange them with Fudd second.

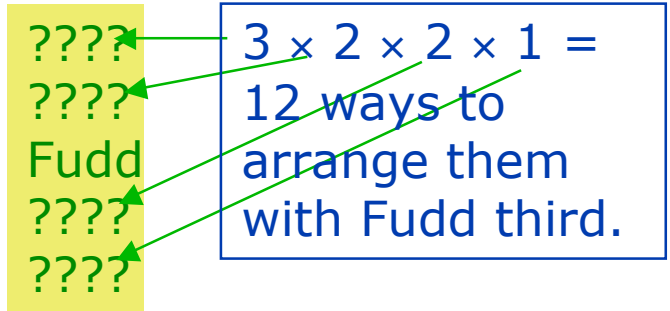
How many possibilities with Fudd speaking third?

????
????
Fudd
????
????

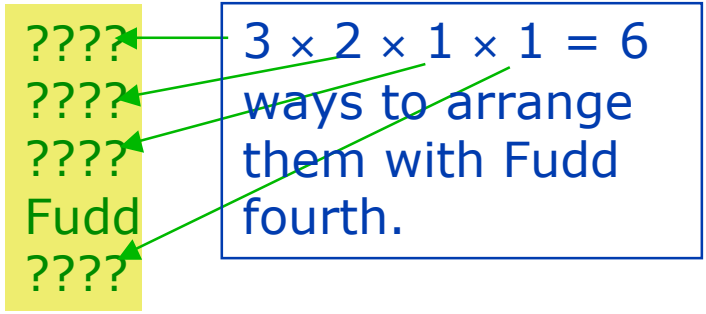
How many possibilities with Fudd speaking second?



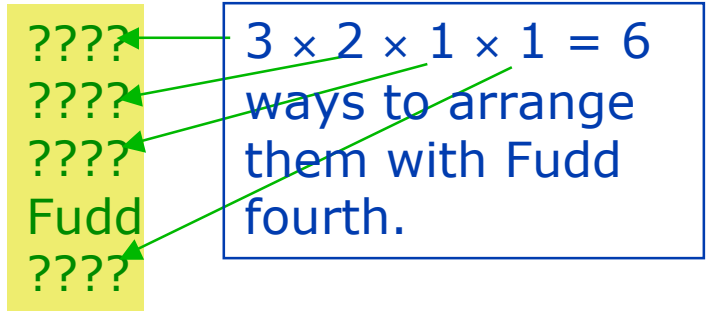
How many possibilities with Fudd speaking third?



How many possibilities with Fudd speaking fourth?



How many possibilities with Fudd speaking fourth?



Putting Fudd last is not possible if Fudd is to speak before Watt.

# ways with Fudd speaking first	24
# ways with Fudd speaking second	18
# ways with Fudd speaking third	12
# ways with Fudd speaking fourth	6
Total number of ways	60

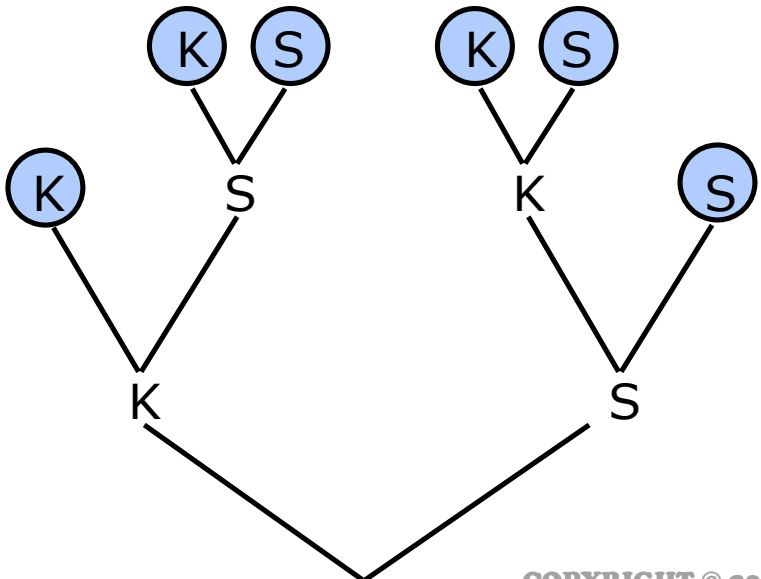
Clever observation

There are 5 speakers, and with if there were no restrictions they could arranged in 5! = 120 ways. Of these 120 ways, there would be just as many arrangements that put Fudd before Watt as there would be putting Watt before Fudd. In other words, half the arrangements would put Fudd before Watt and half would put Watt before Fudd.

$$120 \times 1/2 = 60$$

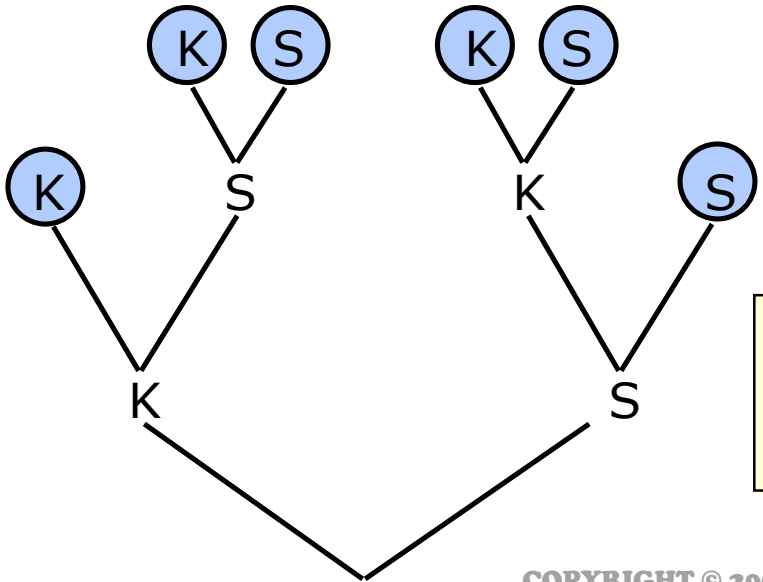
Tracking a Tennis Match

Kim and Susan are going to play a tennis match. The winner of the match will be the first person to win two sets. Draw a tree diagram to represent all the possible outcomes for the tennis match.



Outcomes for a Tennis Match

Kim and Susan are going to play a tennis match. The winner of the match will be the first person to win two sets. Draw a tree diagram to represent all the possible outcomes for the tennis match.



4 + 2 = 6 different cases

Men's Tennis

Players Bob and Tom. To win the match someone must win 3 sets.

How many different possibilities are there for the match? (How many different outcomes would we have it we drew a tree diagram?)

Men's Tennis

Players Bob and Tom. To win the match someone must win 3 sets.

How many different possibilities are there for the match? (How many different outcomes would we have it we drew a tree diagram?)

We'll count the number of possibilities where Bob wins. (There would be an equal number of cases where Tom wins.)

Cases where Bob wins in 3 sets 1

Cases where Bob wins in 3 sets	1
Cases where Bob wins in 4 sets	?

Cases where Bob wins in 3 sets	1
Cases where Bob wins in 4 sets	?

1. ?
2. ?
3. ?
4. Bob

Cases where Bob wins in 3 sets 1

Cases where Bob wins in 4 sets 3

1. ?
2. ?
3. ?
4. Bob

For Bob to win in 4 sets, he would have to win 2 of the first 3 sets.

C(3,2) = 3

Cases where Bob wins in 3 sets	1
Cases where Bob wins in 4 sets	3
Cases where Bob wins in 5 sets	?

1. ?
2. ?
3. ?
4. ?
5. Bob

Cases where Bob wins in 3 sets	1
Cases where Bob wins in 4 sets	3
Cases where Bob wins in 5 sets	6

1. ?
2. ?
3. ?
4. ?
5. Bob

For Bob to win in 5 sets, he must win 2 of the first 4 sets.

C(4,2) = 6

Cases where Bob wins in 3 sets	1
Cases where Bob wins in 4 sets	3
Cases where Bob wins in 5 sets	6
Total # of cases where Bob wins match	10
Total # of cases	20

You could check the validity of this calculation by actually drawing a tree diagram for the match.

The world series in baseball requires that a team win 4 games. If you drew a tree diagram for a world series played between the Braves and Yankees, how many outcomes would your tree show? Can you do this without drawing a tree using the ideas just used in the tennis match?