Counting - 3

Monday, November 23, 2020 10:40 AM

1. No. of ways to put all four employees in one office = 1.

2. No. of ways to put three employees into one office and the fourth employee into a different office = 4.

3. No. of ways to put two employees into one office and two employees into a different office = 3.
   {(A, B), (C, D)
   (A, C), (B, D)
   (B, C), (A, D)}

4. No. of ways to put two employees in one office and one each into each of the remaining offices = 6

Total no. of possibilities = (1 + 4 + 3 + 6) = 14.

Stirling numbers of second kind.

(1) No. of ways to put four distinguishable employees into three indistinguishable offices, so that no office is empty = $S(4, 3) = 6$.

(2) No. of ways to put four distinguishable employees into two indistinguishable offices, so that no office is empty = $S(4, 2) = 7$.

(3) No. of ways to put four different employees into one office, so that it is not empty = $S(4, 1) = 1$.

Total no. of ways = $S(4,3) + S(4,2) + S(4,1) = 14$.

Indistinguishable objects, Indistinguishable boxes

1. 6
2. 5, 1
3. 4, 2
4. 4, 1, 1
5. 3, 3
6. 3, 2, 1
7. 3, 1, 1, 1
8. 2, 2, 2
9. 2, 2, 1, 1

We conclude that there are nine allowable ways to pack 6 identical books into 4 identical boxes.