

Counting

Derangement



Learn how to solve this *type* of problems, not just this problem.



Tip: Always write down intermediate steps.

- (1) Derive the derangement formula D_n .
- (2) Library MAS has m bookshelves for books of m different categories. Each bookshelf has n books. Joe, the librarian, needs to re-arrange these books. Books of the same category still need to be put on the same bookshelf, but their order can change. How many different arrangement plans are there that:
 - (i) no book is put on the same bookshelf as before?
 - (ii) no book is put on its original position?
 - (iii) no book is on the same bookshelf, and no book is at the relative position in the new bookshelf as it was before

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