

- librarian \rightarrow
- 1 x y : Insert a book of y pages at the end of x th shelf
 - 2 x y : Print no. of pages in the y th book of x th shelf.
 - 3 x : Print no. of books on x th shelf.

Query: 2 and 3 \rightarrow Already done

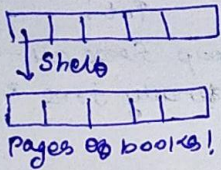
Query: 1 \rightarrow do!

2 arrays:

int * total_number_of_books; // stores total no. of books in each shelf

int ** total_number_of_pages; // 2d array - 1st shelf - books

1st shelf - books



Pointer having pointer of int

1/p: total_number_of_shelves \rightarrow 1/p
total_number_of_queries \rightarrow 2 1/p.

5 \rightarrow 5 shelves

5 \rightarrow 5 queries

1	0	15
1	0	20
2	2	78
2	2	0
3	0	

1 query x y : book of y pages at the end of x th shelf.

15 page book at the end of 0th shelf

20 page book at the end of 0th shelf

78 page book at the end of 2nd shelf.

2 query: no. of pages in y th book of x th shelf.

total_number_of_pages [x] [y] \rightarrow Just print!

3 query: no. of books on x th shelf:

total_number_of_books [x]

books $\rightarrow 10^5$

shelves

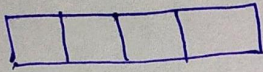
queries $\rightarrow 10^5$

max no. of books $\rightarrow 1100$
per shelf

① memory: Problems: which is the end? → use no. of books!

② malloc! (create space!) → array! → No way!

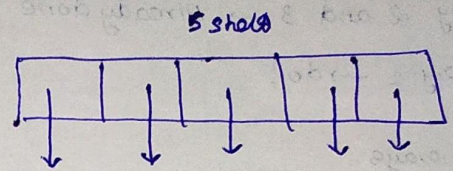
③ Since global variable - `int*`, `int**` already used!



No. of books: `int*` (pointer pointing int)
in each shelf



`free (books);`



First assign: 5 shelves

`int**`

`free (pages) → No!`

(each pointer pointing

dynamic array) - for loop free all - then finally free `int**`!

Pointers holding pointers of `int`!