

“Vanya and Books”

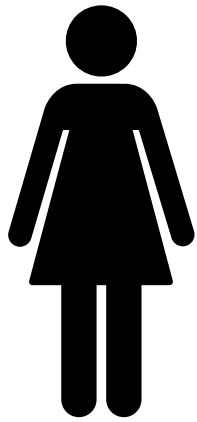
BOOKS

(Codeforces)



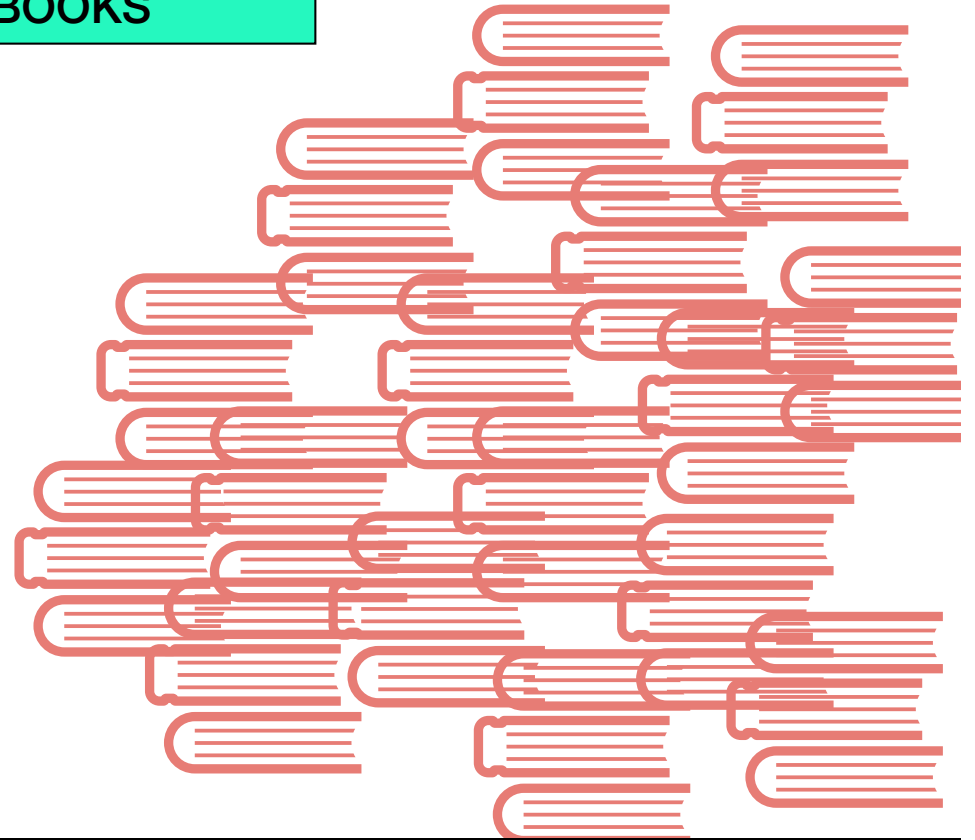
By Prince Agarwal
[“ Hello World ”]

VANYA AND BOOKS



Vanya

Want to provide numbers
from 1 to n



Let say, She has total books = 13

Numbering be like,

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Single = 9

Double = $4 \times 2 = 8$

= Total = 17.

VANYA AND BOOKS

Range of $n = 10^9$ $\xrightarrow{\text{No. Of digit}}$ 1000000000 \rightarrow 10 digit

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,98, 99, 100

9 = $10^1 - 1$

90 = $10^2 - 1$

100, 101, 102, 103, 104, 105,998, 999, 1000

900 $999 = 10^3 - 1$

Now , come to solution,

Make an array

A diagram of a 24-bit register. The bits are labeled 0 through 23 above the cells. Bit 0 is highlighted in green and contains the value 0. Bits 1 through 6 and bits 20 through 23 are red and contain the value 0. Bits 7 through 19 are red and empty. Below the register, arrows point from bits 1, 2, and 3 to the values 9, 90, and 900 respectively.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	0	0	0	0	0	0														0	0	0	0

9 90 900

VANYA AND BOOKS

0	1	2	3	4	5	6	-	-	-	-	-	-	-	-	20	21	22	23	12	13
0	9	90	900	9000	90000	9000000									0	0	0	0	0	0

Take an example : $n = 13$ \longrightarrow Double digit = 4

\searrow
Single digit = 9

Int count = 0;

If ($n - a[i]$) ≥ 0

Count += $a[i] * i$;
n = $n - a[i]$

Else

Count += $n * i$;

$13 - 9 = 4$;

Count = $9 * 1 = 9$

n = 4

4 - 90 == negative

Count = $4 * 2 = 8$

Total = 17

VANYA AND BOOKS

0	1	2	3	4	5	6	- - - - -	20	21	22	23	12	13
0	9	90	900	9000	90000	9000000		0	0	0	0	0	0

Take an example : $n = 233$ Single digit = 9

Int count = 0;

If ($n - a[i]$) ≥ 0

Count += $a[i] * i$;
 $n = n - a[i]$

Else

Count += $n * i$;

\downarrow
 Triple digit = 134 Double digit = 90

$$233 - 9 = 224 ;$$

$$\text{Count} = 9 * 1 = 9$$

$$224 - 90 = 134$$

$$\text{Count} = 90 * 2 = 180$$

134 - 990 ==> negative

$$\text{count} = 134 * 3 = 402$$

$$\text{Total} = 591$$

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Hello World

*“ If you feel any problem then comments in my video
I will reply as soon as possible “*

- Prince Agarwal