

Dutch national
Flag Problem
⇒

sort

3-way Partitioning :- arr: [0's, 1's, 2's] $O(n)$

Saffron white Green

n = # elements in an array

Algo :-

① Initialize $i=0, j=0, k=n-1$

② while ($j \leq k$)

{

if ($arr[j] == 0$)

{

swap ($arr[i], arr[j]$);

$i++; j++;$

}

else if ($arr[j] == 1$)

{

$j++;$

else

{

swap ($arr[j], arr[k]$)

$k--;$

}

}

eg:- 0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1

⇒ 0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1

$i \uparrow j \uparrow k$

0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1

$i \uparrow j \uparrow k$

0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1

$i \uparrow j \uparrow k$

0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1

$i \uparrow j \uparrow k$

0, 0, 1, 1, 1, 2, 1, 2, 0, 0, 0, 1

$i \uparrow j \uparrow k$

0, 0, 1, 1, 1, 1, 1, 2, 0, 0, 0, 2

$i \uparrow j \uparrow k$

0, 0, 1, 1, 1, 1, 1, 0, 0, 2, 2, 2

$i \uparrow j \uparrow k$

0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 2, 2

$i \uparrow j \uparrow k$