

sort:

0	0	1	2	0	2	1	0
---	---	---	---	---	---	---	---

 T: $O(N)$
 S: $O(1)$

p

arr:

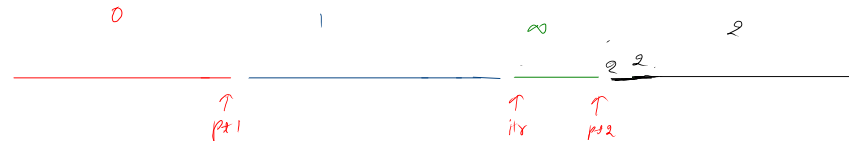
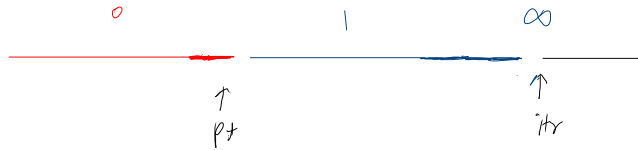
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 i

$[0, p] \rightarrow 0$
 $[p+1, itr-1] \rightarrow 1$
 $[itr, n-1] \rightarrow \infty$

Dutch Nation flag algo

(color region)



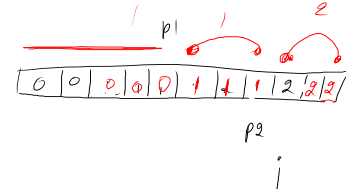
$[0, p] \rightarrow 0$

$[p+1, itr-1] \rightarrow 1$

$[itr, p+2] \rightarrow \infty$

$[p+2, n-1] \rightarrow 2$

```
public void sortColors(int[] arr) {
    int n = arr.length, pt1 = -1, itr = 0, pt2 = n - 1;
    while (itr <= pt2) {
        if (arr[itr] == 0) {
            swap(arr, itr++, ++pt1);
        } else if (arr[itr] == 1) {
            itr++;
        } else if (arr[itr] == 2) {
            itr++ swap(arr, itr, pt2--);
        }
    }
}
```



∞ \leftarrow even \rightarrow \leftarrow odd \rightarrow