

Counting Sort :

for $i \leftarrow 1$ to $K \rightarrow 1 + n + (n-1)$

do $c[i] \leftarrow 0 \rightarrow n$

for $j \leftarrow 1$ to $n \rightarrow 1 + n + (n-1)$

do $c[A[j]] \leftarrow c[A[j]] + 1 \rightarrow n + n$

for $i \leftarrow 2$ to $K \rightarrow 1 + n + (n-1)$

do $c[i] \leftarrow c[i] + c[i-1] \rightarrow n + n$

for $j \leftarrow n$ down to 1 .

do $B[c[A[j]]] \leftarrow A[j] \rightarrow 1 + n + (n-1)$

$c[A[j]] \leftarrow c[A[j]] - 1 \rightarrow n + n$

$$T(n) = 2n + n + 2n + 2n + 2n + 2n + 2n + 2n$$

$$\Rightarrow 15n$$

$$T(n) = 15n \quad n > 0. \quad g(n) = n$$

So $T(n)$ is $O(n)$.