Counting Sort

Key Points

The O(N) sort.

Note: Only limited to small positive integers only.

Input: Given an array.

Output: print the sorted array.

Time Complexity: O(N)

Space Complexity: O(max(Arr))

```
void countSort(int arr[], int n) {
    int k = arr[0];
    for (int i = 0; i < n; i++) {
        k = max(k, arr[i]);
    }
    int count[k] = {0};
    for (int i = 0; i < n; i++) {
        count[arr[i]]++;
    }
    for (int i = 1; i <= k; i++) {
        count[i] += count[i - 1];
    }
    int output[n];
    for (int i = n - 1; i >= 0; i--) {
        output[--count[arr[i]]] = arr[i];
    }
    for (int i = 0; i < n; i++) {
        arr[i] = output[i];
    }
}
```