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Question - 4

Answer

```
void counting_sort (vector<int> &arr)
{
    int n = arr.size();
    int maxm = arr[0];
    for (int i = 1; i < n; i++)
    {
        if (maxm < arr[i])
            maxm = arr[i];
    }
    vector<int> count (maxm+1, 0);
    for (int i = 0; i < n; i++)
        count[arr[i]]++;
    for (int i = 1; i <= maxm; i++)
        count[arr[i]] += count[arr[i]-1];
    vector<int> res(n);
    for (int i = n-1; i >= 0; i--)
    {
        res[count[arr[i]]-1] = arr[i];
        count[arr[i]]--;
    }
    for (int i = 0; i < n; i++)
        arr[i] = res[i];
}
```

Takes an array as input and sort it in linear time.