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//
// main.cpp
// Counting_Sort
//
// Created by Zhenlin Pei on 12/24/18.
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//

// C Program for counting sort
#include <stdio.h>
#include <string.h>
#define RANGE 255

// The main function that sort the given string arr[] in
// alphabetical order
void countSort(char arr[])
{
    // The output character array that will have sorted arr
    char output[strlen(arr)];

    // Create a count array to store count of individual
    // characters and initialize count array as 0
    int count[RANGE + 1], i;
    memset(count, 0, sizeof(count));

    // Store count of each character
    for(i = 0; arr[i]; ++i)
        ++count[arr[i]];

    // Change count[i] so that count[i] now contains actual
    // position of this character in output array
    for (i = 1; i <= RANGE; ++i)
        count[i] += count[i-1];

    // Build the output character array
    for (i = 0; arr[i]; ++i)
    {
        output[count[arr[i]]-1] = arr[i];
        --count[arr[i]];
    }

    /*
    For Stable algorithm
    for (i = sizeof(arr)-1; i>=0; --i)
    {
        output[count[arr[i]]-1] = arr[i];
        --count[arr[i]];
    }

    For Logic : See implementation
    */
}

```

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    // Copy the output array to arr, so that arr now
    // contains sorted characters
    for (i = 0; arr[i]; ++i)
        arr[i] = output[i];
}

// Driver program to test above function
int main()
{
    char arr[] = "geeksforgeeks";//"applepp";

    countSort(arr);

    printf("Sorted character array is %sn \n", arr);
    return 0;
}
```