// C++ Program for counting sort

#include <bits/stdc++.h>

#include <string.h>

using namespace std;

#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 code

int main()

{

char arr[] = "geeksforgeeks";

countSort(arr);

cout << "Sorted character array is " << arr;

return 0;

}