GeeksforGeeks

GeeksQuiz

A computer science portal for geeks

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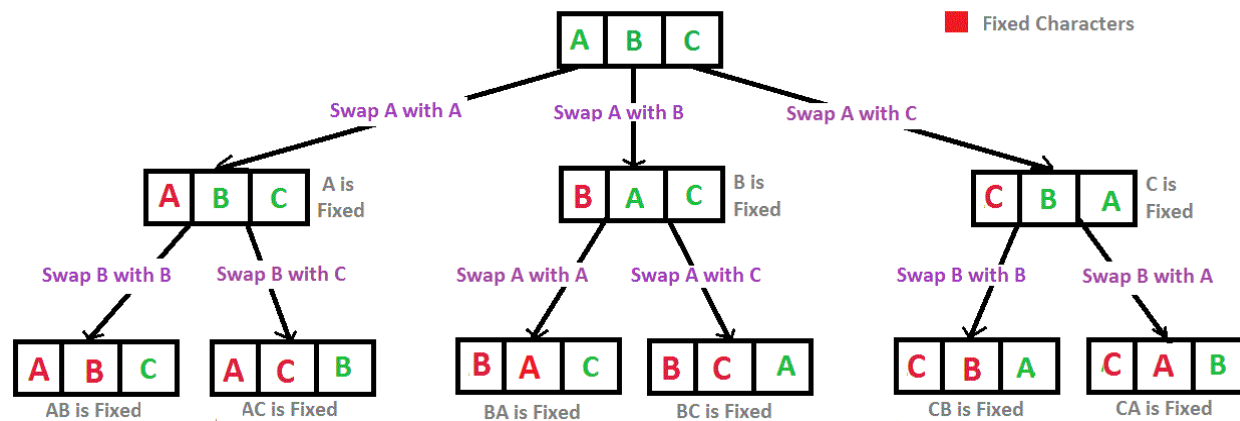| Array | Bit Magic | C/C++ | Articles | GFacts | Linked List | MCQ | Misc | Output | String | Tree | Graph |

Write a C program to print all permutations of a given string

A permutation, also called an "arrangement number" or "order," is a rearrangement of the elements of an ordered list S into a one-to-one correspondence with S itself. A string of length n has n! permutation.
Source: Mathword(http://mathworld.wolfram.com/Permutation.html)

Below are the permutations of string ABC.
ABC, ACB, BAC, BCA, CAB, CBA

Here is a solution using backtracking.

Recursion Tree for Permutations of String "ABC"

```
# include <stdio.h>
```

Interview Experiences

Advanced Data Structures

Dynamic Programming

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Backtracking

Pattern Searching

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Mathematical Algorithms

Recursion

```c
/* Function to swap values at two pointers */
void swap (char *x, char *y)
{
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}

/* Function to print permutations of string
   This function takes three parameters:
   1. String
   2. Starting index of the string
   3. Ending index of the string. */
void permute(char *a, int i, int n)
{
    int j;
    if (i == n)
      printf("%s\n", a);
    else
    {
        for (j = i; j <= n; j++)
        {
           swap((a+i), (a+j));
           permute(a, i+1, n);
           swap((a+i), (a+j)); //backtrack
        }
    }
}

/* Driver program to test above functions */
int main()
{
    char a[] = "ABC";
    permute(a, 0, 2);
    getchar();
    return 0;
}
```

Output:

```
ABC
ACB
BAC
BCA
```

Popular Posts

CBA

CAB

Algorithm Paradigm: Backtracking

Time Complexity: O(n*n!)

Please write comments if you find the above codes/algorithms incorrect, or find other ways to solve the same problem.

Related Tpoics:

- Printing Longest Common Subsequence
- Suffix Array | Set 2 (nLogn Algorithm)
- Rearrange a string so that all same characters become d distance away
- Recursively remove all adjacent duplicates
- Find the first non-repeating character from a stream of characters
- Dynamic Programming | Set 33 (Find if a string is interleaved of two other strings)
- Remove "b" and "ac" from a given string

- Dynamic Programming | Set 29 (Longest Common Substring)

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Writing code in comment? Please use **ideone.com** and share the link here.

► String Java

► String Function

► C String

► C String

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► String 0

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