## Write a 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 CBA CAB

C/C++

We strongly recommend that you click here and practice it, before moving on to the solution.

Here is a solution that is used as a basis in backtracking.

Python

Java

```
Swap A with A

Swap A with B

Swap A with C

Swap B with B

Swap B with C

Swap B with B

Swap B
```

```
// C program to print all permutations with duplicates allowed
#include <stdio.h>
#include <string.h>
/* 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
   Ending index of the string.
void permute(char *a, int 1, int r)
   int i;
   if (1 == r)
     printf("%s\n", a);
   else
       for (i = 1; i <= r; i++)
          swap((a+l), (a+i));
permute(a, l+1, r);
          swap((a+1), (a+i)); //backtrack
   }
/* Driver program to test above functions */
int main()
    char str[] = "ABC";
    int n = strlen(str);
    permute(str, 0, n-1);
    return 0;
}
                                                                               Run on IDE
```

```
ABC
```

Output:

```
BAC
BCA
CBA
CAB
```

Note: The above solution prints duplicate permutations if there are repeating characters in input string. Please

Algorithm Paradigm: Backtracking

see below link for a solution that prints only distinct permutations even if there are duplicates in input.

Time Complexity: O(n\*n!) Note that there are n! permutations and it requires O(n) time to print a a permutation.

Print all distinct permutations of a given string with duplicates.

Write a program to print all permutations of a given string | GeeksforGeeks

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Tree Algorithm Representation Dijkstra's Shortest Path Algorithm Dijkstra's Algorithm bring Bellman–Ford Algorithm for Shortest Paths Optimal Binary Search Tree Largest mum sum rectangle in a 2D matrix. Boolean Parenthesization Problem. Minimal Algorithms. DS GATE Geek Leeks Q&A C C++ Java Interaction C/C++ Articles a computer science portal for geeks. Array. Bit Magic Tree linked List. Stack. Queue. Binary Tree. Binary Search Tree. Heap. Hashing. Graph. Advantage of the Huffman Coding for Sorted Input Prim's Minimum Spanning Tree. Algorithm Prim's Minimum Spanning Tree.
```