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## Generate all possible sorted arrays from alternate elements of two given sorted arrays

Given two sorted arrays A and B, generate all possible arrays such that first element is taken from A then from B then from A and so on in increasing order till the arrays exhausted. The generated arrays should end with an element from B.

For Example

A = {10, 15, 25}

B = {1, 5, 20, 30}

The resulting arrays are:

10 20

10 20 25 30

10 30

15 20

15 20 25 30

15 30

25 30

**Source:** [Microsoft Interview Question](#)

**We strongly recommend you to minimize your browser and try this yourself first.**

The idea is to use recursion. In the recursive function, a flag is passed to indicate whether current element in output should be taken from 'A' or 'B'. Below is C++ implementation.

```
#include<bits/stdc++.h>
using namespace std;

void printArr(int arr[], int n);

/* Function to generates and prints all sorted arrays from alternate elements of
'A[i..m-1]' and 'B[j..n-1]'
If 'flag' is true, then current element is to be included from A otherwise
from B.
'len' is the index in output array C[]. We print output array each time
before including a character from A only if length of output array is
greater than 0. We try than all possible combinations */
```

```

void generateUtil(int A[], int B[], int C[], int i, int j, int m, int n,
                 int len, bool flag)
{
    if (flag) // Include valid element from A
    {
        // Print output if there is at least one 'B' in output array 'C'
        if (len)
            printArr(C, len+1);

        // Recur for all elements of A after current index
        for (int k = i; k < m; k++)
        {
            if (!len)
            {
                /* this block works for the very first call to include
                   the first element in the output array */
                C[len] = A[k];

                // don't increment len as B is included yet
                generateUtil(A, B, C, k+1, j, m, n, len, !flag);
            }
            else /* include valid element from A and recur */
            {
                if (A[k] > C[len])
                {
                    C[len+1] = A[k];
                    generateUtil(A, B, C, k+1, j, m, n, len+1, !flag);
                }
            }
        }
    }
    else /* Include valid element from B and recur */
    {
        for (int l = j; l < n; l++)
        {
            if (B[l] > C[len])
            {
                C[len+1] = B[l];
                generateUtil(A, B, C, i, l+1, m, n, len+1, !flag);
            }
        }
    }
}

/* Wrapper function */
void generate(int A[], int B[], int m, int n)
{
    int C[m+n]; /* output array */
    generateUtil(A, B, C, 0, 0, m, n, 0, true);
}

```

```
// A utility function to print an array
void printArr(int arr[], int n)
{
    for (int i = 0; i < n; i++)
        cout << arr[i] << " ";
    cout << endl;
}

// Driver program
int main()
{
    int A[] = {10, 15, 25};
    int B[] = {5, 20, 30};
    int n = sizeof(A)/sizeof(A[0]);
    int m = sizeof(B)/sizeof(B[0]);
    generate(A, B, n, m);
    return 0;
}
```

Output:

```
10 20
10 20 25 30
10 30
15 20
15 20 25 30
15 30
25 30
```

This article is contributed by [Gaurav Ahirwar](#). Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above\



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