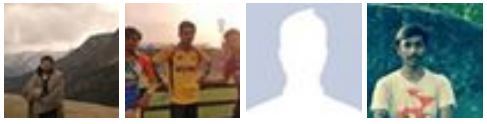
Union and Intersection of two sorted arrays

For example, if the input arrays are:
arr1[] = {1, 3, 4, 5, 7}
arr2[] = {2, 3, 5, 6}
Then your program should print Union as {1, 2, 3, 4, 5, 6, 7} and Intersection as {3, 5}.

Algorithm Union(arr1[], arr2[]):
For union of two arrays, follow the following merge procedure.
1) Use two index variables i and j, initial values i = 0, j = 0
2) If arr1[i] is smaller than arr2[j] then print arr1[i] and increment i.
3) If arr1[i] is greater than arr2[j] then print arr2[j] and increment j.
4) If both are same then print any of them and increment both i and j.
5) Print remaining elements of the larger array.

```
#include<stdio.h>

/* Function prints union of arr1[] and arr2[]
   m is the number of elements in arr1[]
   n is the number of elements in arr2[] */
int printUnion(int arr1[], int arr2[], int m, int n)
{
  int i = 0, j = 0;
  while(i < m && j < n)
  {
    if(arr1[i] < arr2[j])
      printf(" %d ", arr1[i++]);
    else if(arr2[j] < arr1[i])
      printf(" %d ", arr2[j++]);
    else
    {
      printf(" %d ", arr2[j++]);
```

```
      i++;
    }
  }

  /* Print remaining elements of the larger array */
  while(i < m)
   printf(" %d ", arr1[i++]);
  while(j < n)
   printf(" %d ", arr2[j++]);
}

/* Driver program to test above function */
int main()
{
  int arr1[] = {1, 2, 4, 5, 6};
  int arr2[] = {2, 3, 5, 7};
  int m = sizeof(arr1)/sizeof(arr1[0]);
  int n = sizeof(arr2)/sizeof(arr2[0]);
  printUnion(arr1, arr2, m, n);
  getchar();
  return 0;
}
```

Time Complexity: O(m+n)

Algorithm Intersection(arr1[], arr2[]):
For Intersection of two arrays, print the element only if the element is present in both arrays.
1) Use two index variables i and j, initial values i = 0, j = 0
2) If arr1[i] is smaller than arr2[j] then increment i.
3) If arr1[i] is greater than arr2[j] then increment j.
4) If both are same then print any of them and increment both i and j.

```
#include<stdio.h>

/* Function prints Intersection of arr1[] and arr2[]
   m is the number of elements in arr1[]
   n is the number of elements in arr2[] */
int printIntersection(int arr1[], int arr2[], int m, int n)
{
  int i = 0, j = 0;
  while(i < m && j < n)
  {
    if(arr1[i] < arr2[j])
      i++;
    else if(arr2[j] < arr1[i])
```

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```
      j++;
    else /* if arr1[i] == arr2[j] */
    {
      printf(" %d ", arr2[j++]);
      i++;
    }
  }
}

/* Driver program to test above function */
int main()
{
  int arr1[] = {1, 2, 4, 5, 6};
  int arr2[] = {2, 3, 5, 7};
  int m = sizeof(arr1)/sizeof(arr1[0]);
  int n = sizeof(arr2)/sizeof(arr2[0]);
  printIntersection(arr1, arr2, m, n);
  getchar();
  return 0;
}
```

Time Complexity: O(m+n)

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

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