

## **PBL ASSIGNMENT 7**

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**CSE 3 B**

**Q1. Write a program in C to implement merge sort.**

**CODE –**

```
#include <stdio.h>

void merge(int a[], int beg, int mid, int end)
{
    int i,
    j, k;

    int n1 = mid - beg + 1;    int n2
= end - mid;    int LeftArray[n1],
RightArray[n2];    for (int i = 0; i <
n1; i++)    LeftArray[i] = a[beg +
i];    for (int j = 0; j < n2; j++)
RightArray[j] = a[mid + 1 + j];    i
= 0;    j = 0;    k = beg;
```

```

while (i < n1 && j < n2)
{
    if(LeftArray[i] <= RightArray[j])
    {
        a[k] =
LeftArray[i];
i++;    }    else
    {
        a[k] =
RightArray[j];
j++;    }    k++;
    }
    while (i<n1)
    {
        a[k] =
LeftArray[i];
i++;    k++;
    }
    while (j<n2)
    {

```

```

        a[k] =
RightArray[j];
j++;      k++;
    }
}

void mergeSort(int a[], int beg, int end)
{
    if (beg < end)
    {
        int mid = (beg + end) / 2;
        mergeSort(a, beg, mid);
        mergeSort(a, mid + 1, end);
        merge(a, beg, mid, end);
    }
}

void printArray(int a[], int n)
{
    int i;    for (i = 0;
i < n; i++)
    printf("%d ", a[i]);
    printf("\n");
}

```

```
int main()
{
    int a[] = { 12, 31, 25, 8, 32, 17, 40, 42 };
    int n = sizeof(a) / sizeof(a[0]);
    printf("Before sorting array elements are -
\n");    printArray(a, n);    mergeSort(a, 0, n -
1);
    printf("After sorting array elements are -
\n");    printArray(a, n);    return 0;
}
```

## OUTPUT –

### Output

```
Before sorting array elements are -
12 31 25 8 32 17 40 42
After sorting array elements are -
8 12 17 25 31 32 40 42
```

```
=== Code Execution Successful ===
```