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 –