Question 2

```
#include<iostream>
using namespace std;
void merge(int[], int, int, int);
void merge_sort(int[], int, int);
void Display_array(int[], int);
int main()
{
	int array[] = {1,6,3,2,7,5,8,4};
	int arr_size = sizeof(array) /sizeof(array[0]);
	cout<<"Given array is: \n";
	Display_array(array, arr_size);
	merge_sort(array, 0, arr_size-1);
	cout<< "\nThe sorted array is :  \n";
	Display_array(array, arr_size);
	return 0;

}
void merge(int Arr[], int lt, int mid, int rt)
{
	int L1 = mid-lt+1;
	int L2 = rt-mid;
	int i, j, k;
	auto *left =new int[L1], *right =new int[L2];

	for(int i=0; i<L1; i++)
	left[i] = Arr[lt+i];
	for (int j=0; j<L2; j++)
	right[j] = Arr[mid+1+j];
	i=j=0;
```

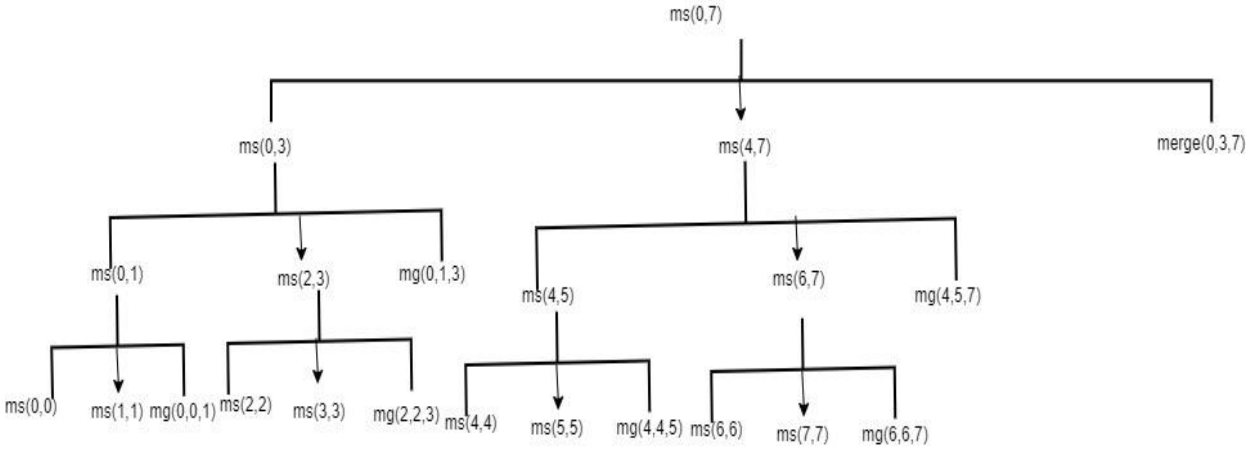
```
        k=1;

        while(i<L1 && j<L2){
                if (left[i] <= right[j]) {

                Arr[k] = left[i];
                i++;
        }
        else{
                Arr[k] = right[j];
                j++;
}
        k++;
}
    while(i<L1)
      Arr[k++] = left[i++];

      while(j < L2 )
       Arr[k++] = right[j++];
   }
   void merge_sort(int Arr[], int l, int r)
   {
        if (l < r){
                int mid = l + (r-l)/2;
                merge_sort(Arr, l, mid);
                merge_sort(Arr, mid+1, r);
                merge(Arr, l, mid, r);
        }
          }
        void Display_array(int a[], int size)
```

```
{
        for (int i = 0; i < size; i++)
        cout<<a[i]<< " "        ;
         }
```



At the first call in Merge_sort l is 0 and r is 7

At the first recursive call in Merge_sort l is 0 and r is 3

At the first recursive call in Merge l is 0 and r is 1

At the second recursive call in Merge l is 2 and r is 3