```
//numbers 5 6 3 7 2


#include <stdio.h>
int main()
{
int arr[30],temp[30],i,j,k,n,size,l1,h1,l2,h2;
        printf("Enter the number of elements : ");
        scanf("%d",&n);

        for(i=0;i<n;i++)
        {
                printf("Enter element %d : ",i+1);
                scanf("%d",&arr[i]);
        }

        printf("Unsorted list is : ");
        for( i = 0 ; i<n ; i++)
                printf("%d ", arr[i]);
 /*l1 lower bound of first pair and so on*/

for(size=1; size < n; size=size*2 )     //size=1*2=2    2<5
        {
```

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        l1=0;
        k=0;  /*Index for temp array*/
        while( l1+size < n)                 /*(0+1)<5  (2+1)<5     (4+1)<5
                                             condition fail and go to
                                             any pair left*/
                                          /*(0+2) <5
        {
            h1=l1+size-1;                  //h1=0+1-1=0   h1=(2+1)-1=2
                                                          h1=0+2-1=1
            l2=h1+1;                  //l2=0+1=1   l2=2+1=3    l2=1+1=2
            h2=l2+size-1;          //1+1-1=1     h2=3+1-1=3   h2=2+2-1=3
            /* h2 exceeds the limlt of arr */
            if( h2>=n )                    //1>= 5    3>=5   4>5
                h2=n-1;
/*Merge the two pairs with lower limits l1 and l2*/
            i=l1;              //i=0   i=2    i=0
            j=l2;             //j=1    j=3   j=2
while(i<=h1 && j<=h2 )    //                    0<=0  && 1<=1   2<=2  && 3<=3
                                                  0<=1 &&2<=3  0<=1 &&3<=3
                                                          1<=1 &&3<=3
        {                              // numbers=    6    5    7      3      2
if( arr[i] <= arr[j] )                 //( arr[0] <= arr[1] condition fail
                                       //( arr[2] <= arr[3] condition fail
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                                        ///( arr[0] <= arr[2] (5 6 3 7 2)  condition fail

temp[k++]=arr[i++];

                        else

                                temp[k++]=arr[j++];     /* temp[0]=a[1]
                                                           temp[0]=5    j=2 and
                                                           k=1 */

                                                        /*temp[2]=a[3]
                                                        temp[2]=3    j=4 and
                                                        k=3*/

                                                        /*temp[0]=a[2]
                                                        temp[0]=3    j=3 and
                                                        k=1*/

                        }

 while(i<=h1)                                           //0<=0    2<=2  0<=1

                temp[k++]=arr[i++];                   /*temp[1]=a[0]   i.e temp[1]=6

                                                           k=2*/

                                                      /*temp[3]=a[2]   i.e temp[1]=7

                                                           k=4*/

                                                     /*temp[1]=a[0]   i.e temp[1]=6

                                                           k=2*/
```

```
while(j<=h2)                                    //2<=1 fail
                                                //4<=3 fail
        temp[k++]=arr[j++];
                /**Merging completed**/
                /*Take the next two pairs for merging */
    l1=h2+1;                                    //l1=1+1=2     l1=3+1=4
        }/*End of while*/      //After 1st step of while, elements are 5 6 7 3 2
                               //After 2nd step of while, elements are 5 6 3 7 2

/*any pair left */
for(i=l1; k<n; i++)        //for(i=4;4<5;i++)
                temp[k++]=arr[i];   //temp[4]=a[4]    temp[4]=2  k=5

            for(i=0;i<n;i++)
                arr[i]=temp[i];   /*contents copied from temporary array to
                                    main array back*    5 6 3 7 2/

            printf("\nSize=%d \nElements are : ",size);    /*size=1    elements are
                                                            5 6 3 7 2 (these
                                                        elements are considered for for loop
                                                            size=1*2) */
```

```
            for( i = 0 ; i<n ; i++)
                    printf("%d ", arr[i]);
}/*End of for loop */                    //Again go back to for loop size=size*2
return 0;
}
```