DATE: / /
PAGE NO.

30/5/24

Lab - 5
Merge sort

```
#include <stdio.h>
#include <time.h>

void split( int a[], int low, int high)
{
    int mid;
    if (low < high)
    {
        mid = (low + high) / 2;
        split (a, low, mid);
        split (a, mid+1, high);
        combine(a, low, mid, high);
    }
}

void combine( int a[], int low, int mid, int high)
{
    int c[15000], i, j, k;
    i = k = low;
    j = mid + 1;
    while (i <= mid && j <= high)
    {
        if (a[i] < a[j])
        {
            c[k] = a[i];
            ++k;
            ++i;
        }
        else
        { c[k] = a[j];
          ++k;
        } ++j;
```

N 30/5/24

```
if (i> mid)
{
  while (j<=high)
  {
    c[k]=a[j];
    ++k;
    ++j;
  }}
if (j>high)
{
  while (i<=mid)
  { c[k]=a[i];
    ++k;
    ++i;
  }}
for (i=low; i<=high; i++)
{
  a[i]=c[i];
}}

void main()
{
  int a[15000], n, i, j, ch, temp;
  clock_t start, end;
  while (1){
  printf("1:For manul entry of N value and
          array elements");
  printf("2:To display time for sorting N
          in the range 500 to 14500");
  printf("3:To exit");
  printf(" Enter your choice:");
  scanf("%d", &ch);
```

DATE: / /
PAGE NO:

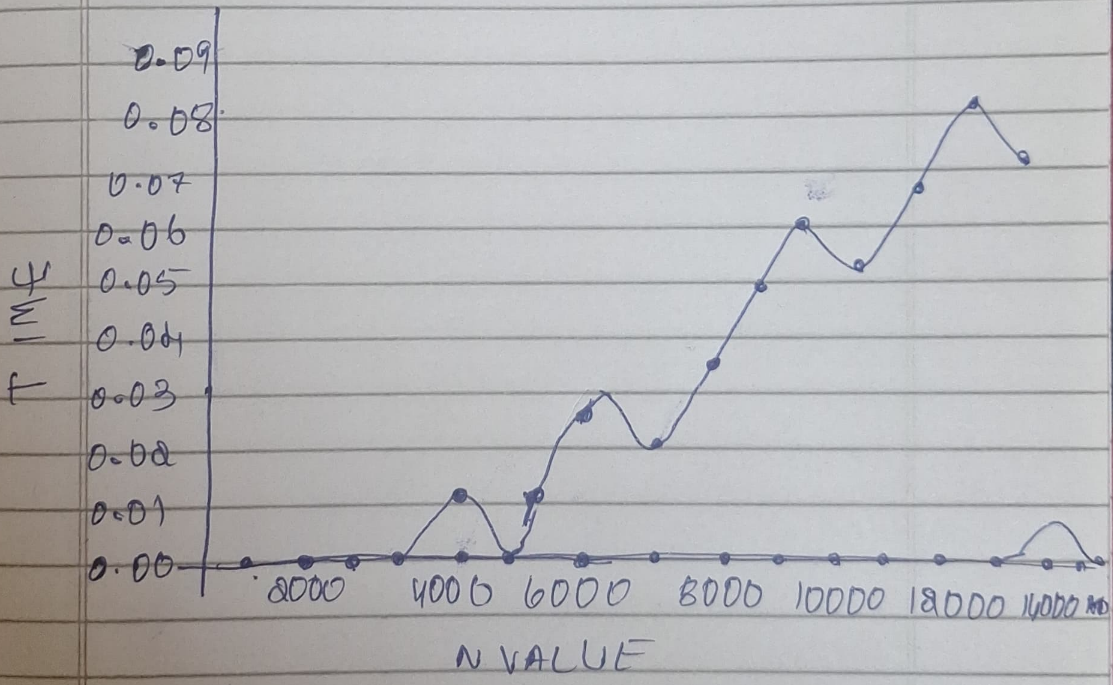
```
switch(ch)
{
  case1: printf("Enter the number of elements:");
         scanf("%d",&n);
         printf("Enter array elements:");
      for(i=0; i<n; i++)
      {
         scanf("%d",&a[i]);
      }
      start=clock();
      split(a,0,n-1);
      end=clock();
      printf("unsorted array is:");
      for(i=0; i<n; i++)
       printf("%d\t",a[i]);
    printf("Time taken:%(double)(end-start)/
                              CLOCKS_PER_SEC());
     break;

case 2:
     n=500;
    while(n<=14500){
      for(i=0;i<n;i++)
       {
          a[i]=n-i;
       }
     start=clock();
     split(a,0,n-1);
     for(j=0;j<500000;j++){temp=38/600;}
      end=clock();
   printf("Time taken:((double)(end-start))/
                         CLOCKS_PER_SEC());
      n=n+1000;
  }
  break;
case 3: exit(0);
}
getchar();
}
}
```

```
1. For manual entry of N value and array elements.
2. To display time taken for sorting number of elements N in the range 500 to 14500
3. To exit
Enter your choice: 1
Enter the number of elements: 4
Enter array elements: 44 33 22 11
Sorted array is: 11 22 33 44
Time taken to sort 4 numbers is 0 secs
1. For manual entry of N value and array elements
2. To display time taken for sorting number of elements N in the range 500 to 14500
3. to exit
Enter your choice: 2
Time taken to sort 500 numbers is 0 secs
Time taken to sort 1500 numbers is 0 secs
Time taken to sort 2500 numbers is 0 secs
Time taken to sort 3500 numbers is 0 secs
Time taken to sort 4500 numbers is 0 secs
Time taken to sort 5500 numbers is 0 secs
Time taken to sort 6500 numbers is 0 secs
Time taken to sort 7500 numbers is 0 secs
Time taken to sort 8500 numbers is 0 secs
Time taken to sort 9500 numbers is 0 secs
```

DATE: / /
PAGE NO. Usha Gold

```
Time taken to sort 10500 numbers is 0 secs
Time taken to sort 11500 numbers is 0 secs
Time taken to sort 12500 numbers is 0 secs
Time taken to sort 13500 numbers is 0.016 secs
Time taken to sort 14500 numbers is 0 secs.
1. For manumal entry of N value and
array elements
2. For display time taken for sorting
numbers in the range 500 to 14500
3. To exit
Enter your choice: 3
```

SELECTION SORT AND MERGE SORT


TIME
N VALUE