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DATE- 08/07/2021

ADA LAB TEST-2

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
 int arr [1000000];
 int temp;
 void maxheap(int arr[], int size, int i)
{
  int j, k;
 For (k = 0; k<180; k++)
{
 For (j = 0; j<40; j++)
 {
}
}
}
 int largest = i;
 int left = 2* i+1;
 int right = 2* i+2;
 if (left < size && arr [left] > arr[largest]
    Largest= left;
 if (right < size && arr[right] > arr[largest]
    Largest = right;
  if (largest != i)
```

```
    {
      temp = arr[i];
      arr[i] = arr[largest];
      arr[largest] = temp;
      maxheap(arr, size, largest);
    }
  }

  void heapSort (int arr[], int size)
  {
    int i;
    for (i = size/2 - 1; i >= 0; i--)
        maxheap(arr, size, i);
    for (i = size - 1; i >= 0; i--)
    {
      temp = arr[0];
      arr[0] = arr[i];
      arr[i] = temp;
      maxheap(arr, i, 0);
    }
  }
  void printArray(int arr[], int n)
  {
    int i;
    for(i = 0; i < n; i++)
      printf("%d", arr[i]);
      printf("\n");
  }
```

```
int main()
{
time_t start, end;
int n;
Srand (time(0));
printf ("Enter the no. of elements \n");
scanf ("%d", &n);
for (int i = 0; i <n; i++)
{
  arr[i] = rand();
}
  Start= time(NULL);
  heapSort (arr, n);
  end = time (NULL);
printf ("The array is sorted \n");

printf ("The time taken is %..10f\n",
difftime (end, start) /
CLOCKS_PER_SEC);
 return 0;
}
```

Modification

```
#include <stdio.h>
#include <time.h>
#include <stdlib.h>
##
// 1) minimum heap
  void heap(int a[], int n){
  int i, j, k, temp;
  for(i=2; i<=n; i++){
  j=i;
  k=j/2;
  temp=a[j];
  while(k>0 && a[k]>temp){
  a[j]=a[k];
  j=k;
  k=k/2;
 }
  a[j]=temp;
 }
}
// 2) heapify function
   void heap1(int a[], int n){
 int i, j, k, temp;
 for(i=n/2;i>0;i--){
 k=i;
 temp=a[k];
 j=2*k;
 while(j<=n)
 {
```

```
if(j<n && a[j] < a[j+1]){
j = j+1;
}

if(temp <a[j]){
a[k] =a[j];
k=j;
j= 2*k;
}
else{
break;
}
}
a[k] = temp;
}
}
```

//3) Array adjustment

```
void adjust(int a[],int n){
for(int i = 0; i <100 ; i++)
{
for (int i= 0 ; i <10; i++)
{
}
}
int i=2, temp = a[1];
while (i<=n){
if (i<n && a[i]> a[i+1])
{
i = i+1;
}
```

```
if (a[i]<temp)
{
a[i/2] = a[i];
i = i * 2;
}
else
{
break;
}
}
a[i/2] = temp;
}
//4) main driver code
  void main () {
 int a [10000], n, i, temp;
 double startTime, endTime;
 printf ("\n Enter the value of n :");
 scanf ("%d", &n);
 printf ("enter the elements to be sorted\n");
 for (i = 1; i <= n; i++) {
 scanf ("%d", &a[i]);
 }
 startTime = clock ();
 heap (a, n);
 for (i = n; i >= 2; i--) {
 temp = a[1];
 a[1] = a[i];
 a[i] = temp;
 adjust (a, i-1);
 }
 endTime = clock ();

printf ("\n After sorting : \n");
for (i = 1; i <= n; i++)
printf ("%d\t", a[i]);
printf["\n Time taken is %f\n",
((double)(endTime - startTime))/
CLOCKS_PER_SEC));
}
```