LAB 10- Heap Sort

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4-D

```
#include <stdio.h>
#include <time.h>
int temp;

 void delay()
{
   for(int i=0; i<10000000;i++)
   {
   }
}

void heapify(int arr[], int size, int i)
{
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;
heapify(arr, size, largest);
}
}

void heapSort(int arr[], int size)
{
int i;
for (i = size / 2 - 1; i >= 0; i--)
heapify(arr, size, i);
for (i=size-1; i>=0; i--)
{
temp = arr[0];
   arr[0]= arr[i];
   arr[i] = temp;
heapify(arr, i, 0);
}
delay();
}

int main()
{
   clock_t start,end;
   double timetaken;
   int rand(void);

   int n,i;
   printf("HEAP SORT\n");
```

```
    printf("Enter the total elements ");
    scanf("%d", &n);
    int arr[n];
    printf("\nGenerating array elements\n");
    for (i = 0; i < n; i++)
    {
       arr[i]=rand();
       printf("%d\t",arr[i]);
    }
    start=clock();
            heapSort(arr, n);

    printf("\n");
            printf("printing sorted elements\n");
            for (i=0; i<n; ++i)
            printf("%d\t",arr[i]);

            end=clock();
            timetaken=((double)(end-start))/CLOCKS_PER_SEC;
            printf("\nTime taken = %f",timetaken);
            return 0;
}
```