ADA-LAB-9

Q) Sort a given set of N integer elements using Heap Sort technique and compute its time taken

CODE-

```
  #include <stdio.h>
void swap(int* a, int* b)
{
int temp = *a;
*a = *b;
*b = temp;
}
void heapify(int arr[], int N, int i)
{
int largest = i;
int left = 2 * i + 1;
int right = 2 * i + 2;
if (left < N && arr[left] > arr[largest])
largest = left;
if (right < N && arr[right] > arr[largest])
largest = right;
if (largest != i) {
swap(&arr[i], &arr[largest]);
heapify(arr, N, largest);
}
}
void heapSort(int arr[], int N)
{
for (int i = N / 2 - 1; i >= 0; i--)
heapify(arr, N, i);
for (int i = N - 1; i >= 0; i--) {
swap(&arr[0], &arr[i]);
heapify(arr, i, 0);
}
}
void printArray(int arr[], int N)
{
for (int i = 0; i < N; i++)
printf("%d ", arr[i]);
printf("\n");
}
int main()
{
   int n;
   printf("Enter number of elements:");
   scanf("%d",&n);
int arr[n];
printf("Enter the elements:");
for (int i=0;i<n;i++)
{
  scanf("%d",&arr[i]);
}
```

```
heapSort(arr, n);
printf("Sorted array is\n");
printArray(arr, n);
}
```

OUTPUT-

```
Enter number of elements:6
Enter the elements:-1 7 2 0 9 8
Sorted array is
-1 0 2 7 8 9

Process returned 0 (0x0)   execution time : 12.823 s
Press any key to continue.
```