Practical-10(E-21)

Problem Statement:
Implement the Heap/Shell sort algorithm implemented in Java demonstrating heap/shell data structure with modularity of programming language

Code:
```
import java.util.Arrays;
import java.util.Scanner;
public class Shellsort
{
void shellSort(int array[], int n)
  {
  for (int interval = n / 2; interval > 0; interval /= 2)
  {
    for (int i = interval; i < n; i += 1)
    {
    int temp = array[i];
    int j;
    for (j = i; j >= interval && array[j - interval] > temp; j -= interval)
    {
      array[j] = array[j - interval];
    }
    array[j] = temp;
    }
  }
  }
  public static void main(String args[])
  {
  Scanner sc=new Scanner(System.in);
  System.out.println("Enter the size of the array: ");
int arr_size = 0;
if (sc.hasNextInt())
{
arr_size = sc.nextInt();
}
int[] arr = new int[arr_size];
System.out.println("Enter the elements of the array: ");
for (int i = 0; i < arr_size; i++)
{
if (sc.hasNextInt())
{
arr[i] = sc.nextInt();
}
}
Shellsort ss = new Shellsort();
  ss.shellSort(arr, arr_size);
  System.out.println("Sorted Array in Ascending Order: ");
System.out.println("The elements of the array are: ");
for (int i = 0; i < arr_size; i++)
{
System.out.print(arr[i] + " ");
}
sc.close();
  }
}
```

OUTPUT:
```
Enter the size of the array: 4
Enter the elements of the array:
12
9
8
7
Sorted Array in Ascending Order:
The elements of the array are:
7 8 9 12
```