

Shell Sort

It first sorts elements that are far apart from each other and successively reduces the interval between the elements to be sorted.

Time Complexity

Worst-case : $O(N^2)$

```
void shellSort(int[] array)
{
    for(int gap=array.length/2;gap>0;gap/=2)
    {
        for(int j=gap;j<array.length;j++)
        {
            for(int i=j-gap;i>=0;i-=gap)
            {
                if(array[i]>array[i+gap])
                    swap(array, i, i+gap);
                else
                    break;
            }
        }
    }
}

void swap(int[] array, int index1, int index2)
{
    int temp = array[index1];
    array[index1] = array[index2];
    array[index2] = temp;
}
```