Chapter 37: Odd-Even Sort

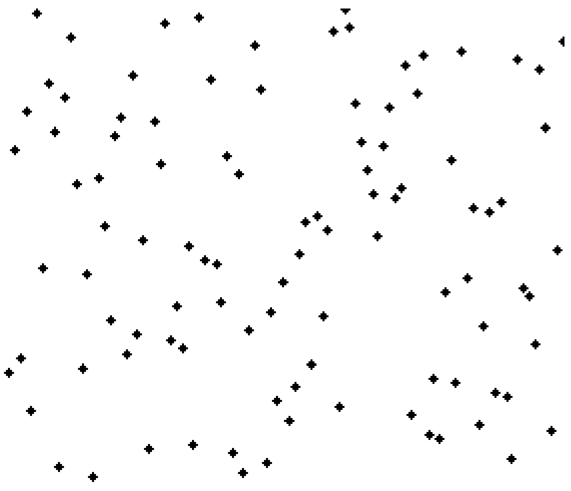
Section 37.1: Odd-Even Sort Basic Information

An Odd-Even Sort or brick sort is a simple sorting algorithm, which is developed for use on parallel processors with local interconnection. It works by comparing all odd/even indexed pairs of adjacent elements in the list and, if a pair is in the wrong order the elements are switched. The next step repeats this for even/odd indexed pairs. Then it alternates between odd/even and even/odd steps until the list is sorted.

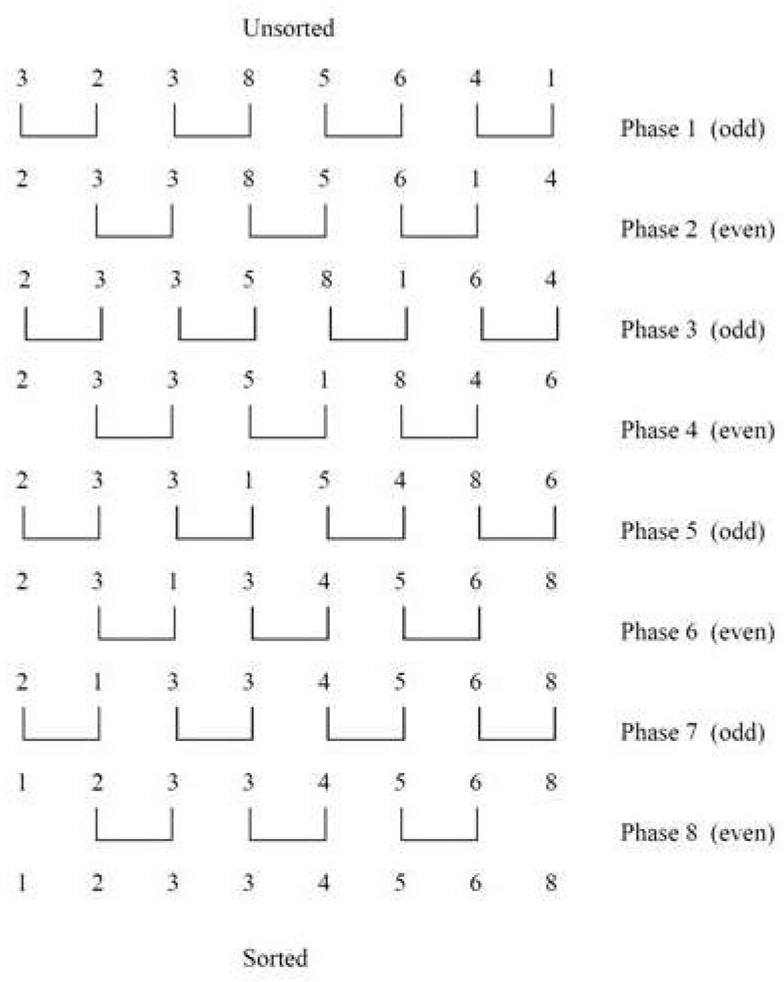
Pseudo code for Odd-Even Sort:

```
if n>2 then
    1. apply odd-even merge(n/2) recursively to the even subsequence a0, a2, ..., an-2 and to the
odd subsequence a1, a3, , ..., an-1
    2. comparison [i : i+1] for all i element {1, 3, 5, 7, ..., n-3}
else
    comparison [0 : 1]
```

Wikipedia has best illustration of Odd-Even sort:



Example of Odd-Even Sort:



Implementation:

I used C# language to implement Odd-Even Sort Algorithm.

```
public class OddEvenSort
{
    private static void SortOddEven(int[] input, int n)
    {
        var sort = false;

        while (!sort)
        {
            sort = true;
            for (var i = 1; i < n - 1; i += 2)
            {
                if (input[i] <= input[i + 1]) continue;
                var temp = input[i];
                input[i] = input[i + 1];
                input[i + 1] = temp;
                sort = false;
            }
            for (var i = 0; i < n - 1; i += 2)
            {
                if (input[i] <= input[i + 1]) continue;
                var temp = input[i];
                input[i] = input[i + 1];
                input[i + 1] = temp;
                sort = false;
            }
        }
    }

    public static int[] Main(int[] input)
    {
        SortOddEven(input, input.Length);
        return input;
    }
}
```

Auxiliary Space: `O(n)`
Time Complexity: `O(n)`