Shift all even elements to left and odd number to right.

So we have a question. We are given array which has some elements into it. What we need to do is shift all even numbers to left and odd numbers to right. We are not allowed to use any extra array.

Example input {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Example Output {10, 2, 8, 4, 6, 5, 7, 3, 9, 1}

So how to solve this problem?

What we can do is skip those elements that are in place and shift those that are not in place.

Time complexity O(n)

Space complexity O(1)

Below is the code for

**package** arrays;

**public** **class** EvenOddLeftRight {

**public** **static** **void** main(String[] args) {

**int**[] a = { 4, 5, 6, 4, 3, 2, 1, 3, 2, 4, 3, 5 };

*evenOddLeftRight*(a);

**for** (**int** i = 0; i < a.length; i++) {

System.***out***.print(a[i] + " ");

}

}

**public** **static** **int**[] evenOddLeftRight(**int**[] a){

**int** i = 0;

**int** j = a.length - 1;

/\*\*

\* There are two pointers

\* i is at beginning and will move forward.

\* j is at end and will move backward.

\* \*/

**while** (i < j) {

/\*\*

\* It is even number so move pointer forward.

\* \*/

**while** (i < a.length && a[i] % 2 == 0) {

i++;

}

/\*\*

\* It is odd number so move pointer backward.

\* \*/

**while** (j >= 0 && a[j] % 2 != 0) {

j--;

}

/\*\*

\* If i < j we need to swap them as they are

\* misplaced.

\* \*/

**if** (i < j) {

**int** temp = a[i];

a[i] = a[j];

a[j] = temp;

}

}

**return** a;

}

}

Let us now write the test cases.

**package** arrays;

**import** org.junit.Assert;

**import** org.junit.Test;

**public** **class** EvenOddLeftRightTest {

**int**[] a1 = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };

**int**[] a1Output = { 10, 2, 8, 4, 6, 5, 7, 3, 9, 1 };

**int**[] b1 = { 1, 3, 5, 7, 9, 11 };

**int**[] b1Output = { 1, 3, 5, 7, 9, 11 };

**int**[] c1 = { 2, 4, 6, 8, 10 };

**int**[] c1Output = { 2, 4, 6, 8, 10 };

@Test

**public** **void** testA1Test() {

Assert.*assertArrayEquals*(a1Output, EvenOddLeftRight.*evenOddLeftRight*(a1));

}

@Test

**public** **void** testB1Test() {

Assert.*assertArrayEquals*(b1Output, EvenOddLeftRight.*evenOddLeftRight*(b1));

}

@Test

**public** **void** testC1Test() {

Assert.*assertArrayEquals*(c1Output, EvenOddLeftRight.*evenOddLeftRight*(c1));

}

}

